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HERESIES

OR

AGNOSTIC THEISM, ETHICS,
SOCIOLOGY, AND METAPHYSICS

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C. K. OGDEN

HERESIES

OR

AGNOSTIC THEISM, ETHICS,
SOCIOLOGY, AND METAPHYSICS

BY

H. CROFT HILLER

VOL. II

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PREFACE TO SECOND VOLUME

IN the two volumes now issued of *Heresies*, I profess to have established, partially or completely as the case may be, the following main points :—That truth is only any sensation of belief. That practical philosophy and a right social dispensation must be grounded on and logically bound to sense-experience. That transcendental physics, and largely modern biology is spurious ontology, involving philosophically futile and anti-moral materialism. That right morality is acted belief and nothing else. That this right morality may be evolutionally fit or unfit according as it emanates from fit or unfit belief. That the sole concern of morality is justice. That our present social system is utterly inconsistent with justice. That there can be no just social system not constituting the individual servant of the state and not dispossessing him of all power to exploit his fellows for his private aggrandisement. That Christian theology is rationally annihilated and, through the

annihilation, constituted a prime source of individual and social degeneracy and a prime impediment to a just social dispensation. That the only rationally tolerable religion is the theism I propound, involving one God and absolute determinism consistent with individual responsibility, but inconsistent with individual faculty-monopoly.

This volume contains anticipatory indications regarding my ultimate doctrines, a contribution regarding the function and application of truth, and investigation of various transcendental implications of natural science. I hope it will place the reader in a position readily to grasp what I have to advance in later volumes regarding God, creation, soul, immortality, and various epistemological considerations, constituting my metaphysic, which is faintly indicated in outline in the present volume. In later volumes, theology, sociology, and ethics will be specifically dealt with.

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HERESIES

CHAPTER I

THE APPLICATION OF TRUTH

IN regard to social customs and habits, we impose restrictions on the individual who is compelled to conform with certain standards of collective belief, or what is commonly taken to represent belief. Accordingly, we now tacitly deny freedom of belief, so far as regards acting that belief, to the individual, to whom we say, by implication : Society has certain standards of belief from which you may deviate only at your peril. This principle is, of course, essential to the cohesion of society. On the other hand, we must remember that these collective standards are valid only so long as they are standards of belief and not of bogus belief. In this work I profess to show that our current moral and religious standards are not standards of belief, but of bogus belief, and that their retention involves collective immorality and idolatry.

I do not primarily attack the credal conventions.

What I attack are the ethical and religious concomitants of their retention. In making this attack I show what are the only conditions on which belief is possible to the educated and intelligent adult. I do not simply advance *my* beliefs as against those of other people, but I apply to myself, as much as to others, universal conditions with no more necessary connection with my personal preferences than with those of anybody else. Like the conditions of the chemist, physicist, or mathematician, mine are imposed entirely from outside my own or anybody else's likes and dislikes. Just as chemistry, physics, mathematics can only exist subject to their credal conditions, so, I maintain, a "fit" society can only exist subject to the credal conditions I indicate in this work.

In stating these conditions, however dogmatic I may appear, my dogmatism is simply that of the scientist who affirms the validity of his demonstrations and is prepared to renounce them so soon as they are invalidated by the method through which they have been attained. In a word, I claim to compel rational people to recognise that the emotional method, which for ages has sufficed for the attainment of religious and moral belief, is now no more applicable to such a purpose than to the purpose of attaining belief in the domain of exact science.

Though the arenas of physics, chemistry, biology are not those of morality and religion, still, when the question is belief or doubt—as it is in regard to morality and religion as fully as in regard to chemistry, biology, physics—that question must be

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decided by the same criterion, intellect, as affords belief to the physicist, biologist, chemist. The basal propositions of morality and religion are just as intellectually cognisable as are the basal propositions of physics, biology, and chemistry. Accordingly, belief in the propositions of religion and morality is as completely within the domain of intellect as is belief in the propositions of chemistry, biology, physics, and the conditions on which religion and morality can exist are essentially the same as those deciding the existence of physics, biology, chemistry.

Most people have the sentimental predisposition for, or what may be termed the emotional substratum of, moral discrimination. For instance, most people feel that it is wrong to lie or steal. Still this feeling is by no means universal among civilised men, and among some savages lying and stealing are virtuous actions. Even among ourselves there is tacit implication of virtue to lying and stealing if practised for certain ends. Take the recent agitation against war with the Boer Republic—here two parties were at issue. One, calling itself Big Englander, acts on the assumption that it is right to lie if what are called imperial interests are served by perjury. Another party, called by their opponents Little Englander, acts on the assumption that it is wrong to assail the Boers because the war would involve inhumanity, race-hatred, strain on our resources, while this party appears to consider of very little moment mendacity on the part of the nation. Both

parties are governed by sentimental preferences, not by intellectual conviction. From his standpoint the Big is as well justified as is the Little Englander. Not genuine morality, but merely ethical sentiment is a factor between them. Each merely wants to effectuate his sentimental liking, just as another sensualist exercises his gustatory liking in ordering a chop rather than a steak.

Obviously, if emotional liking, *qua* liking, is valid to exclude lying for an end, it is valid to warrant lying for an end, so far as ethics is concerned. Accordingly there is no means of deciding on the conditions between the "patriot" and his opponent other than by brute struggle, partisan agitation, and the blind ordeal of votes. This is the method by which we settle all our social concerns, and it is, of course, scientifically worthless. This applies to all sentimental and expedient likings. That one man likes cruelty and mendacity, another doesn't; that one deems expedient what another deems inexpedient has nothing to do with morality. As mere personal preferences one man's likings are as good as another's. If a majority like the honest man rather than the rogue, the liking has no more to do with the morality of the rogue than a liking for sugar rather than for vinegar has to do with their chemical constitution. If we want to know what is moral we must investigate by the method of the chemist who wants to know what constitutes sugar or vinegar. There can be no consistent ethical practice until we have solved this problem: is there a scientifically valid definition

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of right which can be practically applied to decide what forms of personal preference are moral and what immoral? The answer to this question will involve a discussion regarding the application of truth, to which I will now direct the reader's attention.

To the primordial man the products of sensory experience, emotion, and imagination were, we may assume, "fused" into an inchoate whole, so constituting his truth any sensed, felt, or imagined experience. Thus, dreams would afford him the idea of disembodied spirits. He would imagine that the world of action appearing to him in sleep was what may be termed a "double" of the world he realised when awake. At a later epoch imagination would be differentiated from emotion and sensory experience. Then the savage's truth, by degrees, would become constituted only by the latter sensations or experiences, and he would eliminate imagination as a constituent of truth-sensation. (To me the word sensation covers all forms of cerebral and sensory response.) The savage would then believe his emotivity and senses but not his imagination.

So soon as the savage made this differentiation, he manifested a new factor in evolution. This factor we call intellect. It may be defined as the capacity to discriminate psychically, as distinguished from sensually, or as the capacity to distinguish between significance and mere occurrence. Necessarily this faculty of discrimination could only manifest itself so soon as there was something to discriminate, and

accordingly could only come to active existence after other manifestations (sensory experience, emotion, and imagination) had constituted the material for discrimination. (For like reason imagination and emotion could only manifest themselves after sense-experience.)

The more ancient manifestations—sensory experience, imagination, and emotion—differ in one essential respect from intellect; they emanate from bodily reactions to externality involving what psychologists call affective influences, while intellect is, as it were, in opposition to those reactions. This direct bodily reaction to externality is obvious as involving sense-experience, but not so obvious as involving emotion and imagination. Still we must grant that emotion is always the result of some sensual stimulus, direct or indirect through imagination, and that imagination is primarily nothing but a reflection, projection, or distortion of some sensory stimulus. The peculiarity of intellect is that it is what may be termed a spectator and judge of, not an actor in the sensual drama, and has no common origin with what it judges and contemplates.

Emotion, imagination, sense-experience are the animal characters in man. Intellect alone radically differentiates between the human and brute. On the other hand, I do not deny that various brutes partake incipiently of this distinguishing human characteristic.

Until comparatively recent times, no further differentiation, involving what we call truth, occurred between nervous incitements to belief, than that

instituted by the savage who discriminated between imagination and actuality. Even at the present day, among civilised people, there are multitudes who have not yet completely evolved to a differentiation of truth-sensation transcending that of contemporary and primitive savages. Such civilised people, in regard to a certain concern which they call religion—though in regard to no other concern—still believe through emotion and sense-experience. The people who do this are what we consider uncultured, unintelligent, and habit-ridden.

On the other hand, the great majority of civilised people—altogether in their ordinary affairs and largely in regard to religion—have transcended the differentiation of the savage and the retrogressive religionist section. To these evolutionally “fit” believers, truth is solely determined by intellect and sensory experience, to the exclusion of emotion. Thus, these “fit” believers have eliminated emotion as the savage eliminated imagination, as constituent of truth-sensation. The consequence, to many of these evolutionally “fit” believers, of their advanced differentiation of products of sensation is, as I show in this work, that they have become dishonest, and that the society they represent is corrupt.

As intellect and sensory experience now afford us the sole experience of “fit” truth, it is obvious that the only available basis on which we can build truth is sensory experience. Intellect alone can manifestly afford us no such basis, inasmuch as it has no contents at all divorced from sensory experience, emotion, and

imagination, which latter are as indicated, now eliminated, as constituents of truth. Accordingly there is nothing left as "pabulum" but sensory experience. Let us now see what results from applying intellect to this "pabulum," the products of which application we call philosophy and science.

Philosophy may be divided into two great schools—the inductive and deductive. By the inductive school may be understood the one basing its processes of inference on the accumulated truths ascertained by empirical investigation—in other words, deriving truth-sensation through intellect and the sensory "pabulum," to the exclusion of emotion and imagination. By the deductive school may be understood that which tries to account for the cosmos by inference from preconceptions arising through introspection—in other words, which derives truth-sensation through intellect and imagination. Thus, the one school seeks to interpret the universal by intellectualising from the particulars of empirical experience, while the other pretends to interpret the universal by intellectualising from the *idola* of subjectivity, or individual psychosis. From my standpoint, the inductive is the only philosophical method of moment to modern societies, inasmuch as it is the only method based on premises beyond question by normal humanity, and is the only method that can ensure demonstration of an authority for moral right over and above that right.

According to Kant's theories, which colour all modern philosophy of the introspective school, the mind perceives and conceives through certain so-called

a priori principles (categories, forms, etc.). I shall, in later chapters, examine in detail this hypothesis. At present, I may tell the reader that such hypothetical psychical elements really involve nothing but what we understand as specific potentialities for response to external excitation, resulting, through such excitation, in various assumed fundamental percepts and concepts (space, time, quantity, quality, and so on). If we accept as fact these metaphysical entities, they do not affect the proposition that before they can come to active manifestation, externality must afford the element constituting their excitation. We cannot think or sense by "categories" and "forms," unless something not ourselves has interacted with them; if they are internal conditions of our knowing, there must be external conditions before knowledge can result.

My standpoint, to be later enforced in detail, is that these prior conditions (external excitation) to all knowledge involve knowledge itself, and the only sort of knowledge on which we can profitably base other knowledge. They are outside verbal symbolism, constituting what in biological terminology may be called the germinal essence of sensory experience, and what I call unsymbolisable sensation. All I know I know unsymbolised, or in the "germ," before I know it symbolised, or in the "body." I maintain that if we are to deal with profitable truth, we must investigate upwards from these unsymbolisable products anticipating symbolised sense-experience. I maintain that our processes of thought must "evolve" from the rudimentary,

just as all within our apprehension, as phenomenon, so "evolves." From my standpoint, all thought-processes starting "in the clouds" of subjective introspection reverse present natural order and approximate to the evolutionally superseded savage method of deriving truth-sensation from imagination. Such processes are necessarily futile, except in application, as in the case of mathematics, to sensory experience. So soon as we begin our process of investigation by excogitating data of inference, instead of by accepting, as given, the unsymbolisable sensation involving sense-experience, our knowledge becomes a "closed circuit" based on arbitrary premise, and must necessarily hem us within the confines of intellectual abstraction. I contend that all truth so attained must be practically ineffective, so far as it is not merely used as adjunct (as in the case of mathematics) to sensorially based truth.

So soon as we pretend to build a system of thought on foundations not derived from sense-experience, we at once constitute our system either a mere process of logical inference from idiosyncratic and consequently unstable premises, or, granting the validity of our premises, our system becomes a mere edifice of abstract truth, analogous to mathematics, without real bearing on human action. If we could accurately measure the effect on general human conduct of all the great systems of abstract philosophy, from Aristotle to Kant, I surmise that the resultant would practically be *nil*, embracing merely a few disciples of the particular teachers. What is

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now wanted is a system of truth applicable to the world.

In the preceding volume I showed that truth is not any particular article of belief, but is the sensation of belief itself, no matter what it involves. Similarly, morality is not any particular application of belief, but is simply the realisation by action of any belief. On the other hand, just as truth may be "fit" or "unfit," according to its conformity or opposition to the scientific criterion, so may the active realisation of truth, or morality, be "fit" or "unfit," according to the realised truth as which that morality manifests itself.

The man who has attained, by exercise of reason, the conviction that it is right to rob, and who robs, is moral, while his morality is "unfit." The man who has attained no conviction regarding the right or wrong of robbing, but abstains merely because he sees others abstaining, because he has no inclination to rob, or because he fears punishment were he to rob, is an emotionalist to whom, in regard to the abstention from robbing, a moral measurement is no more applicable than to a brute. The man who believes it is right to rob, yet who abstains, is, so far as regards his abstention, immoral, inasmuch as he does not act his "unfit" belief. Again, the society that believes man to be the product of his hereditary conformation and environment, and yet allows the individual to appropriate faculty-product against his fellows, is a robber. Similarly, the society that believes in God as Creator of the universe, and yet

allows children to be deceived by implications that God is not that Creator, is a liar.

The enthusiast who gratifies himself by what is commonly understood as philanthropy, unless his gratification involves action through belief, is of no more moral account than is another sensualist who gratifies himself by debauchery. Of course, as expediency, the philanthropy is better than the debauchery, but the moral criterion only applies to the one or the other so soon as it involves the execution or non-execution of intellectual belief. The society that encourages the philanthropist, but opposes the debauchee, unless the encouragement or opposition emanates from intellectual truth regarding debauchery and philanthropy, as being right or wrong, is itself, so far as regards the particular action, not morally different from the debauchee. Its expediency is no more moral than is the debauchery or philanthropy. The enthusiasms against drink and gambling, as commonly manifested, are merely gratifications of personal appetites not essentially different from the gambler's and drunkard's, and as utterly devoid of moral quality.

The end of morality is justice. The normally intelligent and educated man cannot be unjust if he acts according to "fit" belief. There can be no moral society that does not enforce "fit" belief on the individual. There can be no "fit" belief to enforce that does not emanate from sense-experience, as strictly intellectual elaboration of that experience.

The only criterion of the value of truth (apart

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from its application to sensual ends) is its effect on conduct. In this respect all philosophy not rooted in sensory experience must ever, from my standpoint, contrast unfavourably even with the most irrational religious "faith." Never can such philosophy fire humanity with moral ideals efficient to determine action. All it can do is to produce a few wranglers, sceptics, and academic believers. Never can such philosophy reveal an authority for action superior to syllogistic aphorisms and expediential axioms, and, accordingly, never can such philosophy raise the individual above the promptings of his selfish lusts.

So long as we cannot demonstrate an authority for right superior to that right, the demonstration of right must merely involve abstract truth to which each will yield only according to his self-interest. Such abstract morality represents the highest possibility of *a priori* philosophy, because that philosophy is inherently unable to project an authority for morality beyond human intellect. Always at the last resort, when it comes to choosing between self and the rest, man will obey only God or human *force majeure*. No philosophy that does not demonstrate God as Authority to be obeyed can be a real incentive to humanity. No philosophy can demonstrate God that does not lay its foundations in sensory experience. This occurs because all philosophy not based on sensory experience must be pinnacled where it is founded—in human intellect. On the other hand, a philosophy based on sensory experience has its pinnacle, necessarily as I shall show, in the Author

of human intellect. As it emanates from outside intellect, so does it culminate outside. As the other philosophy originates in intellect, so it never transcends intellect.

Intellectual truth, without emotive incentive to practise that truth, can have no practically moral issue. The mere demonstration of ethical right is nothing unless we impel to its practice. We can only ensure its practice by arousing emotion in favour of the practice, and we can only arouse that emotion by demonstrating God as the Authority for ethics. Men must be coerced to morality, whether by fear of human force, or by fear of, or veneration for, a Power above that force. After intellect has convinced, emotion must drive, or there is no practical result. No philosophy that cannot inspire emotion for right is of practical avail to humanity, and no philosophy not based on sensory experience can inspire that emotion.

The philosophy needed to-day must be a *religion*. To get such a philosophy we must transcend the senses by inferring from them, not by weaving logical gossamer about fancy images in the chambers of our own intellects. Our philosophy must now evolve from our science, as that evolved from our sensory experience. Before we can accept our intellectual images as well-born, we must see that their genealogical line reaches to progenitors of sense. We cannot now afford philosophically to maintain a bastard brood of intellectual chance-children. Philosophy must now be born of science, and that science,

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of sensory experience, which, I shall show, is not the case with much that passes as science.

In the preceding volume I indicated that truth was of various grades. The truth of introspective philosophy is "unfit," because it involves no emotional compulsion to right action, and is built on the unstable premises of psychical idiosyncrasy. The truth of Christianity is now "unfit," because it only exists for the uneducated and unintelligent. The truth of science is "fit," because it is conclusive to every educated and normally intelligent person. On the other hand, it is defective, because it does not bear emotionally on moral action. The only "fit" truth in regard to this, the highest phase of "fitness," is the truth of philosophy built on that of science. Only through this truth do we attain conviction regarding the sole Authority competent practically to enforce, through emotive incitement, what is revealed as moral right.

In earlier ages the above office of philosophy was fulfilled by emotional religion. As such religion no longer represents truth, through the inability of normal people to believe through emotion, evolution has produced a substitute in this philosophy, which may be termed intellectual or scientific religion. It involves emotion, as did its predecessor, only the emotion it involves is consequent to, instead of independent (as in the prior cult) of, intellectual conviction, and is on behalf of objectively demonstrated right, instead of on behalf of certain emotive manifestations as was its predecessor.

If a man believes that God commands him to exercise justice, and recognises that this justice practically involves benevolence, he has a creed offering all the emotive incentive incident to the Christian faith. Given the truth (which I hope to establish) that God exists, it matters naught so far as religious emotion is concerned, whether God's command is to love one another, or to be just to one another ; and it matters no more from a practical standpoint, inasmuch as if we are just to one another, we shall render all the mutual service possible under a dispensation of love. Moreover, the command of justice is obviously to a higher order of agent than was that of love, inasmuch as the exercise of justice is less a matter of automatism, more of free volition, than is the manifestation of love. To an age devoid of intellectual compulsion to belief, the command to love was all-sufficient, inasmuch as it appealed to the only faculty—emotion, then governing the motives of mankind. In these days the command to love is inefficient, because motive is now conditioned by intellectual discrimination, and we feel as truth that the credentials of the command to love are invalidated. That we can no longer believe the possibility of theological sin disables us from accepting the authority for the command to love, so far as that love is not involved in justice, but is merely obedience to a supposed prototype who showed love by dying to save humanity from the consequences of theological sin.

In the moral sphere the formal retention of dead

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truth—*i.e.* the practical pretension to believe what is intellectually repudiated—involves dishonesty. What is dead truth? Conclusion irreconcilable, with sound inference from premises acceptable to cultivated intelligence. What are these premises? The conclusions of true empiricism. But the cultivated and intelligent do not represent the majority. Suppose the majority believe the dead truth, how are they to be treated? It is the business of society to rectify their defective apprehension of truth, and to ensure a cultivated majority. When this is achieved, it is the business of society to enforce the “fittest” truth, compelling the individual who holds defective truth to amend his apprehension, or, in his public capacity, practically suppress it. If a man now believes it right to steal, he has either practically to suppress his belief, or go to prison when he is caught manifesting it. Similarly, when society has properly educated its units, if a cleric believes the Christian cult, in his public capacity he must either intellectually establish the validity of his cult, or cease imposing it on the credulous, ignorant, and immature. If a politician then believes it right to lie, crawl, cringe, betray, in order to attain prominence, he must act his belief at his peril. In a word, whoever holds “unfit” truth must, in the eventuality assumed, amend it, or, in his public capacity, suppress its manifestation. Such is the condition of a dispensation based on scientific religion. Then, let everybody act his belief, but let him also see that he believes “fitly.” As an isolated unit, he has full

liberty to hold what truth he likes. In his public capacity he has no more right to exercise "unfit" truth than to poison his fellows.

It may be asked, How is the truth of scientific religion to be applied to the multitude of contingencies arising in everyday affairs? For a society such as ours the application is largely impracticable; but for a society constituted according to that truth, the application would be simple. Once establish, to common acceptance, the principle that every man is socially tolerable only to the extent that he lives by service to the community—the first and socially most important determination issuing from sound inference from sensory experience—then there can be few everyday, and no important contingencies not readily amenable to scientific solution. On the other hand, when, as under our system, the recognised object of every man is to live by preying on the community, instead of serving it, we can no more practically apply scientific rules of conduct to the vagaries of the ordinary man than to those of the asylum inmate.

The truth of scientific religion requires a society constituted according to its dictates. Before attempting systematically to apply that truth to the individual, we must educate him up to demanding that society shall be reconstituted on a scientific basis. We must have a moral social organism before we can apply moral tests to individual activities. What is now before those able to apprehend the truth and willing to exemplify it is to educate the masses up to it; to show them its intellectual validity; that it alone can

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ensure justice and their real emancipation to the status of manhood ; that it is as truly divine command as was ever revelation vouchsafed to humanity.

Under the present system there is no scientific appraisalment of services. The greatest rewards are not for the greatest service, but for the greatest cunning and rapacity. At present the astute parasite despoils *ad libitum*, while the producer, from lowest to highest grade—handicraftsman to artistic, scientific, mechanical, intellectual adept—toils for a comparative pittance, or for kicks without pittance. Such is the practical issue of “survival of the fittest” under our unscientific system of bludgeon-my-neighbour. As society alone constitutes value for service—a Shakespeare or bricklayer is of no account if there is nobody to appreciate poetry or to want a house—society, even from a comparatively low standpoint, has the right to determine the reward, and if based on scientific truth, society will apportion scientifically.

The ultimate economic issue of all the different branches of exact investigation now before mankind is that individual faculty-product belongs, by ethical right, to the community. The forces against the practical application of this truth are the animalistic appetites of those sections of society in which, at present, brute power is centred. However, this brute power only exists by virtue of the brute ignorance and intellectual torpidity of the million. The great question under these circumstances is, Will the powerful minority reject the new truth until the million have accepted it ; or will that minority accept

it before the million do, and prepare the way for its practical exemplification? That it will have to be exemplified, no intelligent person acquainted with the conditions can doubt. *How* it will be exemplified—whether through cataclysm, or orderly transmutation—depends on the capacity of the powerful minority to recognise the inevitability of the change and to reconcile themselves to it.

Internationally, dissensions would cease with the application of scientific truth, inasmuch as, just as the individual's function would be to serve his own society, so would one nation's function be to serve another. In fact, under the conditions, civilisation would practically become one nation. At present the dissensions of nations are not really on behalf of the nations concerned, but of a numerically minute section, mainly parasitical, of those nations. When civilisation is educated up to scientific religion, there will be no soldiers, except to repel aggression, and no aggression to repel. Only a religion based on emotive truth is compatible with militarism. If the command is, Love one another, the implication is also, Option to hate one another. Where emotion is dictator, circumstance decides the option. Not so is it when the command is, Be just to one another. Then there is no option. Intellect is above circumstance, and justice is the creature of intellect. If we act the command, Love one another, we act it mainly as automata—animals. If we act the command, Be just to one another, we act it as, relatively, free agents—men.

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That the command to love one another involves the option to hate one another is well illustrated by what Mr. W. T. Stead has stated to an interviewer regarding his pamphlet, *Shall I slay my Brother Boer?* Mr. Stead, so I read, has sent his pamphlet to every clergyman and minister in Britain, and he avers that the majority of the replies from these professional exponents of the religion of love are "diabolical in spirit." Many of these followers of Christ deny brotherhood with the Boers. One clergyman, replying to the question of the pamphlet, wrote, "Yes, and be quick about it," and a Wesleyan minister took unction to himself for having just preached a "war sermon." Obviously, in the case of these professional followers of Christ, the appeal to emotion involves very elastic methods of conformity. In the case of these exponents, the doctrine of love and the doctrine of hate appear to constitute what I may term an emotional amalgam in which the identity of each constituent is predominant merely according to the personal preferences of the particular exponent. Inevitably this must be the case in these days of impossibility of emotional belief. Indeed, if we impartially contemplate the ages of emotional belief, we shall find that the doctrine of love has involved as much animosity as could conceivably have existed had hatred, instead of love, been the ostensible ideal. We shall find that even belief in the protagonist of the doctrine, as divine authority, has never really overcome the inherent tendency of emotional incentive to degenerate into mere gratification of passions and prejudices.

When we contemplate the psychical revolution effected by modern science, we must realise the utter inadequacy of a religion of which the *summum bonum* is the mere exercise of emotion, and we must see the inevitability of a revelation superseding such a cult. That it is now impossible to apply the truth of Christianity involves that we must have new truth we can apply in its place. Such truth must necessarily correspond to the altered conditions which now govern truth in general. While it appeals to emotion on behalf of exercise, such new truth must appeal to intellect on behalf of validity. As the Christian cult does not fulfil the latter condition, it necessarily fails to fulfil the former. It is not now exercised, because a condition for exercise exists which formerly was absent. Just as there was a flint age and is an iron age, so, in the psychical arena, was there an emotional age and is there now an intellectual age. The attempt to adapt the Christian cult to our religious necessities is now no more rational than would be the application of prehistoric chipped flints in place of our steel instruments. To call ourselves a Christian nation is to label ourselves with a lie. Were we to render adequately penal non-conformity in action with Christian doctrine, we should at once virtually extirpate professing Christians. I venture to assert that not one educated professing Christian in a million, in this country, can rationally reconcile his daily activities with the fundamental teaching which he attributes to Christ.

The toleration of emotion, as criterion of truth in

the moral arena, permeates all our activities, constituting them mere issues of our animal prepossessions. Analysis of our conventional proprieties reveals them as, at the bottom, nothing better than a blind game of grab for self-gratification. Let us consider a few characteristic activities to illustrate this point.

One man wants to confiscate the property of the wealthy because he does not like suffering. Another wants to shut up public-houses because he likes poverty and misery less than he likes dictating to his fellows what they shall drink. Another wants to stop the granting of fresh licenses to sell "drink" because he owns a number himself and does not like competition. Another wants fresh licenses granted because he wants some himself. Another wants England to be a liar by repudiating her treaty obligations, because he does not like Boers and remembers Majuba, or because he is interested in land-syndicates, mines, stock-exchange juggling. Another consistently avows as truth what he knows to be falsity, because he prefers to earn his bread as a journalist rather than as a navvy, scavenger, or other honest worker. Another builds a church or chapel, and has his name in philanthropic contribution lists because he likes taking interest on his capital in the shape of reputation for benevolence. Another sits in a pew because he likes to be "respectable." Another thunders against Church millinery because he wants a good rousing party-cry. Another clamours for religious ceremonial because he likes

thimble-rigging before God, with empty shells and husks, as if they contained kernels and grains. All, under our present conditions of confusion of emotional prepossession with intellectual truth, resolves itself, on ultimate analysis, into drab, sordid, narrow, warped gratification of self. True altruism, which is true egoism, is utterly outside this world of gutter-wriggling.

In all cases involving really productive action, we act as we believe. In the realms of art, science, literature, thought, handicraft, only he who acts as he believes shows work of real moment to society. The mental helot in literature, art, thought, who prostitutes his faculty by pandering to what that faculty rejects as truth is a noxious ephemera; his work is dead before it is properly born. The man who invents a steam-engine, sewing-machine, telescope, who constructs a table, cuts a coat, who writes for to-morrow as well as to-day, acts as he believes. He is a profitable servant. The intelligent and cultured man who inculcates the Christian faith acts as he does not believe, but as he wants to appear to believe. The same motive, expediency, impels him as impels the common thief who knows his action is wrong. This applies to the literary "reptile," the commercial and political trickster—throughout the arena of our social activities. Only he who practically manifests his truth is, according to scientific religion, a "fit" member of society. The rest, according to scientific religion, are *rogues*. Some of these rogues, at present, we exalt; others we oppress.

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When "fit" truth is applied, all these rogues will be "in the same boat" and will sink together.

All deliberate action not based on fit belief is, ultimately, for the purpose of defrauding society—of "sneaking" more from society than we render to it. Parasitism, in its multifarious aspects, is the necessary economic issue of such action. Capitalism exists through it. Financial success is only possible by lying in action—by pretending to believe. Commercial buying and selling illustrates the same principle. In all such cases, not reward for service is the goal, but plunder for cunning. The application of "fit" truth involves the annihilation of all such modes of action. In every sphere of life, at present, it is practically impossible to be honest and prosper; so, virtually, the honest man has ceased to exist. Scientifically scrutinised, we are a nation of rogues and determine our paragons and culprits according to their special forms of roguery.

Naturally, those steeped in such an environment as ours deem impossible its remodification. To them, anybody who exposes its rottenness is a jaundiced disturber of established order; anybody who tries to rectify its defects is an impractical dreamer. Like the pig, the good wallowers object to washing! However, nature decides that the practical men of one age are made by the "dreamers" of another. Ideas have governed the world for a long time and are not now likely to vacate the position of vantage. From every side of the world of ideas now resounds the command: Let "fit" truth be applied and honesty

prevail! At present, however, only he moving in that world hears the command. Soon it will bring to "attention" the multitude.

Some of my critics, in pretending to meet my contention regarding the nature of truth, urge such commonplace superficialism as that a man can believe what is not true. I hope it will be clear to the reader of this work that a man can only believe what is true. I will cursorily restate the dialectical and scientific demonstration that we can only believe what is true. First we will consider the dialectical argument. What is truth to others, but not to himself, a man cannot believe; *ergo*, the others' truth is not the particular man's truth, which must be truth, *i.e.* belief, *to himself*. No other truth can exist, for the man, than his own truth. Issue: a man can only believe what is true. Now let us turn to science. I demonstrate that truth is sensation—something felt, like, say, a pin-prick, and that truth is nothing more than such sensation. If truth is sensation, it will obviously change according to excitation, so that what is true to-day may be untrue to-morrow. To-day, people may have one sensation, as specific truth; to-morrow, another. Similarly, two people may have different sensations, at the same time, as truth. Each will believe only what is true, to himself—the only possible truth for the individual. How are we to decide between these two true believers? Obviously, we can only decide about the respective truths by applying the test of collective experience—science. Then, the man who has truth inconsistent with the

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test needs education. When he is educated, he will renounce his earlier truth. The public's duty is to compel him to be educated, and to govern its own action by the scientific standard of truth. The truth (as final, absolute, universal decision) imagined conventionally, is an impossibility according to science and dialectics, and truth, without corresponding action, is like mustard without beef!

Earlier in this chapter I referred to certain sections of the British public known as Big and Little Englanders. The Big Englander tacitly accepts the proposition that lying and injustice are permissible, provided they are motivated by a desire to extend the material power of the nation. The Little Englander opposes this position, from a variety of motives almost entirely sentimental and expediential, but not moral. Really, as between the ethics of the two sections, there is, at present, nothing to choose. Both sections equally confound belief with emotional prepossession. The real ethicist has to clear the slate of the expediency and sentiment of the Little, as completely as of the expediency and sentiment of the Big Englander, before he can attain a scientific adjustment of their differences.

The first point to decide is: Is lying ethically justifiable under any circumstances? The answer is: No. Why? Because lying opposes the normal sequence between belief and action. A lie involves action contrary to belief. Thus, a lie is essentially wrong because it is morbidly abnormal, just as is, say, brutality to a mother. No subsidiary considera-

tions of expediency can alter the immoral character of a lie any more than they can alter the immoral character of filial brutality. But, it may be urged, suppose a man *believes* that a certain end justifies an immoral means, does he not act according to belief by manifesting this conviction? Yes; but his belief is "unfit," just as a congenitally blind and deaf man is "unfit." Our law courts recognise the fact by sending to prison people who act according to such belief. Then, it may be urged, our law courts compel those who believe it right to lie for certain ends, to suppress their belief and, *ex hypothesi*, to act immorally. The reply is: The law does not ask them to suppress their belief, but merely tells them that, until they have attained "fit" belief, they must act their "unfit" belief at their peril. They are moral, so far as they act their belief, but, their morality, being conditioned by "unfit" truth, is itself "unfit." Ethics says to the Big Englander what the law says to the perjurer.

Turning to the Little Englander, as mere sentimentalist or expedientalist, he wants to enforce his views because he objects, say, to the cruelty of war, or because he thinks war will be ruinous to the material interests of the nation. His motive is virtually the same as that of the Big Englander. His sentiment is against cruelty and for the preservation of material interests; the Big Englander's sentiment ignores cruelty, but also demands the preservation of interests. There is no more ethics in the one than in the other case. The pseudo-

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beliefs of each equally arise from expediential desires, or sentiment; not, as if they were genuine beliefs, from intellectual demonstration. If the sentimental Little Englander opposes lying, he opposes it for essentially the same reason (his personal likes and dislikes) as the Big Englander approves it. Accordingly, there is no court of appeal between the two, but that of brute power to enforce their respective decisions. Thus, ethics is altogether out of the question.

When we turn to justice, in the abstract, we find that it is simply the application of "fit" belief to action. Injustice, if conscious, is equivalent to an acted lie, or, if unconscious, to an acted "unfit" truth. Thus, the consciously unjust person is equivalent to the deliberate liar, and the unconsciously unjust person is equivalent to the criminal who suffers for his faulty truth as a believer in contingent sanction for perjury. In an equitable society, the consciously unjust person would be punished as a deliberate rogue, and the unconsciously unjust person would be penalised as a holder of "unfit" truth. Such a society would only tolerate "fit" truth and action conforming with it. Again, as justice, in the abstract, is the application to action of "fit" truth, and this latter is the sensation arising from the "fit" or logical application of intellect to specific contingencies, concrete justice implies that, as no man is the author of his faculties and opportunities, all forms of aggression are immoral, and that any personal appropriation of the products of faculty, against the community, is a mode of aggression on the rights of others. This applies

to a nation as much as to an individual. All aggressive warfare is ethically unjustifiable because it involves the application of national power, or faculty, to self-aggrandisement against the world-community. Thus, justice is "fit," injustice "unfit" truth in action. Conscious injustice is equivalent to deliberate lying; unconscious injustice is equivalent to lying through defective apprehension of warrant or sanction. "Fit" truth is the mental sensation arising from the application of intellect to premises consistent with the collective experience embodied as science.

Truthfulness and mendacity—not merely in the narrow application, to words alone, but also to action—embrace *all* moral good and evil. All else we consider moral good and evil is a matter of convention, prejudice, or sentiment, and has nothing to do with moral good and evil. A lie (acted or spoken) is the prototype, essence, germ of all moral evil. No expedient or sentimental consideration can change the ethically evil nature of a lie; like cancer, it is an essentially morbid abnormality. The twin brother of a spoken lie is conscious injustice. Lying and injustice constitute all the *essential* moral evil of the world. A liar and a conscious dealer of injustice are as loathsome to the moral sense as a leper is to the visual sense.

Granted all the above, it may be asked: How shall we set about ensuring the prevalence of truth and justice? I reply: By winning over a majority willing and able to enforce truth and justice by the power of the nation, and by ensuring belief in God as authority for the revelation of truth and justice.

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In the one case, we shall appeal to the individual through fear ; in the other case, through his volition as a moral and religious being. If we can demonstrate God, and that intellect is the only faculty through which intelligent and cultured people can now believe, we can demonstrate that what is imposed, by intellect, as truth and justice, is imposed by God, and, if all normal people intuitively perceive that truth and justice are right, mendacity and injustice wrong, we can then demonstrate that God has decreed truth and justice to prevail over mendacity and injustice.

If we do not apply the test of science to decide collective truth, we have obviously no validation but personal prepossession. It is quite possible, under such conditions, for a lunatic to impose truth on conventionally sane people. In fact, I believe that much bygone collective truth was so imposed. I believe that much of what we call religious truth was imposed by people who, judged by modern criteria, would be insane. "Madman of God" is no empty phrase. I believe that God has used many madmen in imposing religious truth on humanity. I believe that were a duplicate of Christ to-day to emulate the founder of the Christian faith, he would be treated as insane. In these days, indeed, we have insane individuals imposing rationally outrageous truths on ostensibly sane people. To take an instance, we see the emotional conflagration of a Friedrich Nietzsche imposing itself, as a revelation of truth, on a number of presumably sane and intelligent people in this and other countries, who fail to recognise that the "big

blond brute," gratifying his lusts at the expense of his fellows, is as inconsistent with the facts of evolution as would be the retrogression of humanity into its ancestral anthropoid type.

Every truth not genealogically bound to the bed-rock experience of sense illustrates the essential quality of the rationally abortive visions of the German atavistic genius whose work, I surmise, will nevertheless not be futile if it help to raise men above the spurious, and under present conditions of belief, hypocritical sentimentalism now posing as the supreme doctrine of altruism. We now want egoism, but not the egoism of the brute. We now want the egoism that knows no master but intellect and acts no truth but what intellect imposes. To the extent that he helps the downfall of the now spurious religious cult of emotionalism, Friedrich Nietzsche is a "madman *of* God." To the extent that he influences feeble reactionaries to bray against the rule of morality, he is a "madman *against* God."

There can only be two sorts of egoists and both must be slaves—one the slave of emotion ; the other, of intellect. Evolution has used the former for all he is worth. Now, evolution is going to place the latter in harness. He is the God-decreed successor of the Nietzschean "big blond brute." The egoism exemplified by the successor of the brute will be the altruism to overcome the world.

As a "madman *against* God," Nietzsche proclaims that "slave morality" is the bane of humanity, and that "master morality" is its salvation. By "slave

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morality" he means any discipline opposing the animal instincts in mankind. By "master morality" he means the uncontrolled indulgence of those instincts. The issue of the practical application of such truth as that of Nietzsche is really—as the pseudo-egoism of competitive everyday life—the canker of modern civilisation. What Nietzsche advocates and what really constitutes the motive of the average "struggle-for-lifer" is not real, but bogus egoism. The "master" of Nietzsche and the "successful Christian" are simply slaves to their emotions. The real "master" is slave of his intellect, by constituting it the master of his emotions. The real "slave" is the libertine governed by his "likes and dislikes." The "master" is the rational animal constituting his "likes and dislikes," the servants of his apprehension of scientific truth outside and independent of his personal prepossessions. When a man is a true egoist, he exercises volition or genuine discrimination. When a man is a bogus egoist, or "big blond brute," he manifests the clockwork-imposed responses of an automaton. Modern society is rendered putrid by the bogus egoist.

The aberrant apostle of pseudo-egoism rails at Christianity as being the arch-foe of humanity, and supposes that cult to involve an ideal essentially different from that of his own "master morality." Really, the difference between the Christian cult and that of Nietzschean "master morality" is merely a difference between "slave moralities." Slaves are,

indifferently, the issue of both cults. The genuine Christian slave—in these days of unbelief hardly existent—manifests his state by hypnotising himself with one form of animal emotion. The pseudo-egoistic slave or “overman” of Nietzschean nightmare manifests his state as self-hypnotism by another form of animal emotion. As “madman of God,” Nietzsche unconsciously makes for the downfall of his “overman,” deriving his incentive from hatred of the Christian “underman.” As a slave, he works for God-decreed emancipation through confounding it with the slavery in which he himself is enmeshed. The tools of God work blindly!

The modern Socialist by sympathy is another example of the blind tool. He makes for the emancipation of humanity through confounding his own form of slavery with emancipation, and trying to upset the established pseudo-egoism by his own. His animal emotion, involving “unfit” truth, is confounded with true volition. Unlike the Nietzschean slave, this Socialistic one is apt to invoke the Christian slave-cult as ally in his own campaign on behalf of slavery. He tells you that Christ was a Socialist, and that, accordingly, Socialism by sympathy is true Socialism. Again, the professional religionist, as slave, finding “Christian Socialism” conducive to his pseudo-egoistic interests, allies himself with the Socialist by sympathy. So of the non-professional religionist—so long as his pseudo-egoism (belly-struggle) is not affected, he coquets with “Christian Socialism.” All these pseudo-egoistic slaves are the

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blind tools of a destiny making for real master morality, or true egoism, which, again, embraces true altruism as one of its issues.

In regard to the application of scientific truth to action, the great point to be first decided is, not how moral right has arisen, but is, does God exist? If we can intellectually demonstrate the existence of God, then we can intellectually demonstrate that the truth we apprehend as present right is imposed by God to be practised by the individual, just as any scientific truth applicable to the construction of a mechanical contrivance is to be so practised. Whether truth regarding moral right has originated in mere empiricism or in extra "natural" intuition is beside the point that we now have such truth, and, that having it, it is imposed by God.

In this work I profess intellectually to establish the existence of God and the fact that there is no moral right other than action according to belief, which belief can only now exist in a "fit" state, as logical inference from sense-experience. Applying this truth to action, its first demand is that all human faculty, as being endowment by God, of the individual, and so outside the initiative of the individual, shall be exercised for the profit of the community; and that to the extent that the individual exercises such faculty to the profit of himself, to the exclusion of the community he shall be considered an enemy of the community, as offending, not merely the interest of the community, but the sense of equity imposed by God on the human intel-

lect. So soon as society has reconstructed itself according to this principle of divinely revealed justice, normally constituted individuals will govern themselves according to the manifestly just principle which they recognise as conditioning their society. Such self-government will involve true master morality, constituting each individual a co-operator with the rest for the benefit of the whole. Under such conditions, if society, in its own interest, considers it expedient to offer higher reward for one than for another form of service, no querulous discontent will arise, inasmuch as no sane man will deny that some social services are more valuable than others to the community ; or will contend that society has not the equitable right to encourage those more valuable services by graduated rewards.

Scientific religion imposes its truth on the individual as *decree of God*. It appeals to the individual as a true "master"—as one who can discipline his animal lusts by his intellect. It encourages such discipline by offering society to the individual as example of that discipline. It demands that, until that society exists, the individual shall spare no effort to ensure the advent of that society.

Some of my friendly critics, who profess to be practical people anxious to see my ideal realised, demur to my method of attaining it. These people call themselves Radicals, Socialists, and, sometimes, even Conservatives, and seem to believe they are aiding the Socialistic ideal by what they call municipalisation and various schemes involving concealed

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confiscation, such as taxation of land values, in the shape of "unearned increment" arising from the increase in value of land, independently of effort by the landlord. The advocates of the latter form of confiscation are mainly people engaged in trade. They want to "bleed" the landlord and ignore that the principle they apply to him equally applies to themselves; that the "unearned increment" of trade is just as real and obvious as that of landholding, inasmuch as all value-increase in commodities—of which land is only one—necessarily arises from society, not from the effort of the individual.

All such palliative schemes are rather impediments than aids to the establishment of the true Socialistic ideal, by diverting public attention from the great moral issue and concentrating that attention on mere material considerations only incidental to the real problem of the coming social reorganisation, which problem really is, not to reorganise the distribution of means of sensual gratification, but to reorganise the motive of the citizen.

If we get the belly reorganisation before we have the psychical reorganisation, we shall indefinitely retard, rather than accelerate, the only consummation of real moment in the connection. This consummation is, of course, the substitution of collective and individual honesty for the present dishonesty—not merely new economic conditions, but, first and foremost, a new *religion*. We can have no real Socialism until we have an adequate constituency following its intellect regarding God. To attempt to lay the

foundations of Socialism in mere economics is no more rational than would be the effort to establish asceticism by providing everybody with turtle-soup and champagne. Socialism is a question of motive, not merely of satisfying animal appetites. If we begin by satisfying the appetites, we at once render our constituency—to take a pathological simile—immune to that moral contagion which alone can render practicable the Socialistic ideal.

We do not want contentment until we have recognition of the meaning of duty. We have now an affluent minority whose contentment is the great impediment to remodification of their motive. If we simply substitute for this minority a majority, we shall merely transfer the difficulty of remodification of motive from the minority to the majority. Only discontented people are amenable to new ideals affecting conduct. As practical reformers, our first business *is to render the affluent discontented, not to render the indigent contented.*

Assuming the goal to be happiness, we must, as practical reformers, discriminate between the happiness of the pig and that of the “fit” human. Socialism involves the latter form of happiness; but, at present, the only form predominantly manifest is the former. If we start by rendering wider the area of sensual comfort, we shall render more difficult the substitution of the human for the animal form of happiness. As practical reformers, we do not want to multiply contented “pigs”!

As practical reformers, our first concern must be

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the comparatively intelligent, cultured, and affluent sections of the community. We want to inspire these sections with *belief*, of which they are at present devoid. Our truth must percolate *to* the "residuum"; it cannot surge up *from* the "residuum." We must appeal to the intelligence of the skilled and thinking workman, of the thinking trader, manufacturer, financier, aristocrat, artist, pressman. We must not appeal to the rapacity of one against another section. Then, when we have obtained our moral constituency, we may start the material re-modification without the danger of merely multiplying "pigs." The mere alteration of material conditions will be a very simple matter once we have obtained our moral constituency. Given that constituency—which can only arise through intellect conscientiously applied and rigidly followed—the material alteration might be effected in a month, with hardly any disorganisation of the existing processes of production.

Some learned people, fond of evolving theories from their "inner consciousness," have satisfied themselves that religion and morality have arisen from rudiments that we should consider childish superstitions. Other people, not necessarily learned, but well endowed with prejudice against religion and morality, are trying, by artful insinuation or bold assertiveness, to impress on the public that, inasmuch as religion and morality have arisen from obsolete beliefs, they are necessarily of no consequence to modern society. Quite a number of clever folk are

now trying to sneer away religion and morality on grounds that would equally warrant them in sneering away modern science.

Because some prehistoric people are supposed to have started religion, say by ancestor-worship, myth, or nature-worship, we are invited to believe that religion is of no account in this nineteenth century. Because some prehistoric folk are supposed to have started morality from, say, "the reflex instinct of defence" (according to Letourneau), we are invited to believe (as, for instance, by my late lamented friend, J. F. Nisbet) that, "in the universe at large, there is no more Right or Wrong than there is Up or Down, or North or South." Candidly, I tell the reader, I care not a jot how religion or morality has arisen. That I know each is here and can intellectually validate both is enough for me.

Some theorists contend that observance is the essence of religion—that all they are concerned about as investigators of religion, are its mechanical manifestations or rites. Because primeval man brought offerings, made sacrifices, prostrated himself, or in a multitude of ways showed a special sentiment in regard to a special apotheosised dead man, or to his supposed divine posterity, and because an evolutionary continuity can be demonstrated between the most primitive of such activities and the rites and concepts of the most developed modern cults, it is assumed by such investigators that religion is nothing, at root, but the savage's idea of caring for the body until the soul, which has transiently left it, shall re-

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occupy it. Granted that the *origin* of religion may be nothing but this primitive idea, we have to concern ourselves with the evolution of this origin, just as we have to concern ourselves with the evolution of organic types from analogous rudiment. The ideational substratum behind the mere sensual illustrations is what constitutes the real germ of religion. The observances are mere externalisations of the *idea*.

That the savage offers food to the corpse in a supposed long sleep from which the corpse will awake is perhaps the prime rudiment of religious observance, but if we are to measure the significance of religion, we must contemplate, from the stand-points of psychology, biology, and metaphysics, the development of the idea behind this observance. That the idea of the ghostly "double," of the primitive savage, has become transformed into various ideas of God, culminating in the idea of the modern scientific religionist, constitutes the great fact we must ponder in estimating the significance of religion. When we scrutinise from this wide standpoint, we must grant that the religious idea and its supplementary correlative, the moral idea, constitute the most stupendous evolutionary phenomenon within human apprehension, far outclassing evolutionary manifestations in the physical domain.

Judged by the above standard, specific cults are but modes of religion, as specific compulsions are modes of morality. Religion and morality can no more be exterminated by the extinction of specific

cults and compulsions, than science can be exterminated by the extinction of specific theories. Religion, morality, science, philosophy are organisms—part of the universe-fabric, no more vitally affected by metamorphosis of their contents than a human organism is vitally affected by normal processes of waste and repair during life. Religion, morality, science, philosophy are constituents of the universe itself, as the heart is a constituent of the human organism.

Through a transient phenomenon entailing the downfall of a specific mode of religion, called Christianity, a number of people talk, write, and act as though religion itself were dead as consequence of such internal metabolism, whereas the apparent destruction is itself the essential preliminary of a new process of growth and shows the vitality, instead of the demise, of religion.

Again, a number of folk try to discredit religion on account of the evil perpetrated on its behalf; but they overlook that the evil apparent to us was not evil to those who perpetrated it, and that their truth, to them, was as good as is our truth to us. We must always remember that the essence of moral evil is, action against belief. Actions, in themselves, are neither evil nor good. They only have moral attributes so soon as they are judged by moral standards, and the only moral standard available to our apprehension is, action according to belief.

Once accept the definition of truth I afford in this work, it is evident that the great question is not

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how a particular creed, observance, faith has arisen, but is : Does such creed, observance, faith now conform with the criterion governing the sensation of belief for educated people? Apart from mere curiosity, we really no more want to know the origins of religion and morality than we want to know the origins of modern physiology ; of the modern convention that man is the creator of his faculties and opportunities and the rightful owner of what accrues from them ; of the modern truth that (according to the particular judge's standpoint) vaccination or vivisection is a good or bad thing. All that rational moderns really need to know is the validity of their existing truths. This validity simply involves that the truths conform with the scientific criterion.

That the prehistoric man's notions of morality and religion were not ours, does not involve that his religion and morality were not as true as are ours. On the other hand, if the prehistoric man showed his belief in his religion and morality by acting them, he was a better religionist and moralist than is our modern bishop.

The implication of many who perplex themselves with investigation of the origins of religion and morality seems to be that, to authenticate our religion and morality, we ought to discover that primeval man held them. To me, the direct contrary is true. Could I be assured that primeval man held our religion and morality, the assurance would cause me more scepticism of, than reliance on that morality

and religion. I should at once argue that the non-metamorphosis of these products was presumptive evidence of their "unfitness," just as I argue to the "unfitness" of the modern civilised individual who, in his common activities, emulates his primeval ancestor.

Precisely because the modern man places a gravestone over his dead relative, not to prevent the body from troubling him by rising from the grave, but merely to show his regard for the memory of the deceased, I am disposed to believe with the modern man, just as I am disposed to believe with another modern man who, for scientific reasons, directs that his body, after death, shall be cremated rather than buried. On the other hand, that a modern or a prehistoric man does or did this or that with his dead, has not a particle of influence with me in deciding about the soul and immortality. All I am concerned about, in this connection, is the evidence available to me for or against *my* belief in the soul and immortality. I care no more for evidence that the prehistoric man did or did not believe in a soul and immortality, than I care (apart from morality) for evidence that John Smith, pietist, believes in both ; or that John Smith, atheist, believes in neither. What interests me, as a mere seeker of belief, is the evidence of each John Smith on which he bases his supposititious belief. I am not a bit interested as a simple seeker for truth, apart from moralist, in the mere fact of the belief ; but I am much interested in its validity.

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Some folk who sneer down religion and morality because of their seemingly base origins are great sticklers for science, and, as already remarked, are curiously blind to the fact that, from their standpoint, it is no more logical to be a stickler for science, than for religion and morality. If present experience cannot validate religion and morality because the origins of religion and morality are, to us, naïve superstitions, why should present experience validate science which has arisen from equally naïve superstitions? If we test science by its present truths, not by the rudiments of the alchemist and astrologer, why shall we test religion and morality by the rudiments of the prehistoric savage instead of by reason applied to science and the facts of everyday experience? "We are all evolutionists now." Especially this applies to the clever people under consideration. And yet they implicitly stipulate for religion and morality to drop from the clouds as finished, complete divine afflatus, while eagerly bowing to science which no more resembles its "germ" than religion and morality now resemble theirs. Really, it is time these evolutionists, as belittlers of morality and religion, learnt to be consistent.

As I hope I have established in this work, the essence of the right application of truth is—acting it. The prehistoric savage who acted his belief was moral and religious. The modern pietist who acts what he does not believe, is immoral and irreligious—whether he be a pope, archbishop, cardinal, vestryman, or simply a sit-in-a-pew-man. If we believe

there is no God or morality, let us act our belief! Then, we shall be moral. If society believes there is God and morality, let society act its belief and oppress those moral folk who believe there is neither God nor morality, and act their belief. If we profess to believe that God exists and that Jesus Christ is God's Son, coequal with God, let us act what Jesus Christ taught, or be kicked out of society as rogues and vagabonds.

From the ethical standpoint, a man, in his individual capacity, may hold any truth, *so long as he acts it*. If he does not act his truth, he holds it dishonestly and is a *rogue*. On the other hand, so far as society is concerned, promiscuous truth cannot be tolerated, inasmuch as such toleration would involve dishonesty by society, as not acting its own truth. Society accordingly demands "fit" truth, that is—truth conforming with collective experience. There is no means of deciding what constitutes "fit" sensation of truth except logical inference from sense-experience constituting the particular truth a genuine evolutionary development of rudimentary sensibility. Any other form of truth is what, in the biological arena, is termed a "sport." So far as society is concerned, such eccentric truth cannot be adopted until it is shown to conform with the evolutionary criterion of descent from sense-experience. Of course, much truth as speculation starts as such a "sport," and is only later found to conform with the evolutionary criterion. During the ages of emotional belief, the world was moved

mainly by truths as "sports." The individuals who discovered those truths necessarily could not demonstrate their evolutionary connection with collective experience. For us, such truths are noxious or abortive—atavistic survivals.

Thus, under earlier conditions involving the possibility of emotive belief, much spurious (to us) truth irreconcilable with the evolutionary standard became practically "fit" truth. The enthusiasms constituting emotive religions are instances in point. These religions, or strictly, modes of religion, are now dead through the altered conditions determining belief. The evils of modern civilisation arise from pretension to retain the "form" or "body" of such religions when their "material" or "soul" has vanished. This pretension to retain rationally putrid religious corpses as living faiths affects the whole arena of social activities, and the issue is—a nation of rogues. Men cannot be honest in their common affairs if they are dishonest regarding religion. Religion is the "germ" of social life. If the germ is rotten, all the rest is rotten.

The present "fit" sensation of truth, like every special organic faculty of response to externality, is a product of evolutionary differentiation. In the new-born infant all sensation may be assumed as an undifferentiated *primordium* of sensibility—a "fused" chaos of potentialities—to be later transformed into the multitudinous special experiences or actualities constituting what we call sensory, emotional, and intellectual perceptivities. For many ages, there

was no differentiation as between intellectual and emotional belief, and men necessarily believed through emotion. Later, as men accumulated and recorded sensory experiences, there arose the perception of a constant and sequential system of objective relationships independent of subjective prepossession, or emotion. Then began, as deduction from induction, the differentiation of intellectual from emotional truth-sensation. As in primitive humanity, the emotional form of truth-sensation constituted an evolutionally more advanced differentiation, as compared with the mere sensory truth-sensation of low animal types, so, in modern civilised man, the intellectual form of truth-sensation has transcended and superseded the emotional form. The intellectual believer of to-day is an evolutionary superposition on the emotional believer of the past, as that emotional believer was such a superposition on a still more primitive type whose experiences were virtually limited to responses of the sense-organs. This applies still further back to an epoch when even sense-organs were not evolved and nothing but motor reflexes constituted organic activity.

The individual always believes, for himself, truly. False belief, so far as he is concerned individually, is an impossibility. On the other hand, in relation to society, the individual may believe falsely. He will almost invariably believe falsely, in relation to society, if he experiences the evolutionally superseded, or emotional, form of truth-sensation. It is the business of society to enable the individual to feel truth as the

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evolutionally latest form of sensation. In other words, it is society's business to ensure that all social questions shall be decided according to the intellectual criterion of truth, and, for this purpose, to remove ignorance and penalise the public propagation of non-intellectual truth.

At present there is not even apprehension of what constitutes morality, and the old pseudo-morality of emotionalism is rapidly becoming practically extinct. People still talk it, but they act it strictly according to convenience. The existing moral, or rather unmoral conditions, are the inevitable consequence of the downfall of emotional belief and lack of a substitute. Idealism has abdicated and sensualism rules the roast, because we are now only able to believe through intellect, and, as yet, intellect has given, to popular apprehension, no substitute for what emotional conviction and aspiration once constituted the supreme truth of humanity. Judged intellectually, our morality, to-day, has hardly reached what I may term the alchemic and astrologic stage of development, and the emotional incentive which was once effective as substitute for real morality has vanished.

The emotive religious cult which for centuries sufficed to ensure a factitious authentication of pseudo-morality being no longer believed, it is obvious to me that, failing a regenerative remedy, the time is not distant, if it is not here already, when lying and thieving will excite not even sentimental repugnance, but practically will be

esteemed virtues. In politics, diplomacy, finance, and commerce, this inversion is already well in evidence. As to religion, we have only to compare the affirmations of clerics and laymen with what it is rationally possible to believe, to recognise that lying is a prime essential to religious conformity. Again, if we contemplate public opinion, as represented by the largest section of the press, we shall find that the only national ideal is to extend the material power and territorial area of the empire, no matter at what cost of moral dereliction, and that those who venture to raise a voice on behalf of national integrity are treated as renegades from the nation's cause. Again, the most popular literature of the day is that which panders to this vainglorious intoxication.

We are now at the beginning of one of the greatest, if not the greatest struggle in our national existence. In a shape adapted to altered mental conditions, Puritanism will again have to set itself to eradicating the elements making for national dissolution and individual atavism. Intellect, and intellect alone, will have to direct the struggle. The fighters will need as sternly to set their faces against the lures of emotionalism as their forefathers set theirs against the lures of the senses. Emotion, as distinct from emotionalism or unreasoned submission to personal prepossession, will burn as fiercely as ever, and for a mightier cause than this nation has yet won or lost.

The social application of "fit" truth involves scientific justice, to some aspects of which I have

already referred in this chapter. It may be asked : Does the application involve what Christians call the Golden Rule—doing to others as you would be done to? It involves this, if your desire for others' action towards yourself conforms with "fit" truth, not otherwise. The logical application of this Christian or Confucian axiom renders it practically impossible through the implication of universal submission which, again, is the gravamen of all Christ's reputed utterances regarding conduct. Nobody wants to be excelled. Then, to follow the Rule, as expounded by Christ, the Christian must allow all others to excel him. In doing so, he prevents others from observing the Rule, inasmuch as their excelling him involves its infringement. Thus, the Rule is impossible according to Christian and logical interpretation. So far as regards our practice of the Rule, after nineteen centuries of preaching and expounding it by professional exemplars, and after untold millions have lived and died Christians, the upshot is : the powerful "struggle-for-lifer" says he likes everybody to fight for his own hand, and will be glad to meet and take a thrashing from anybody stronger than himself. The cunning rogue says he likes everybody to live by his wits, and will be glad to meet and be "done" by a keener "file" than himself. Throughout the arena of social activities this is the result of nineteen centuries of the Golden Rule.

The Rule only becomes practicable if we qualify it by the direction that what we desire of others is to conform with scientific justice. When a man desires

in this way he can practise the Golden Rule because his desire will then be that all shall be honest servants of society. Recognising that the efficiency of each is for the benefit of the whole, though he will still desire not to be excelled, the desire will be opposed by the conviction that his own interest is served by the most efficient service to the community, and that only by personal rivalry is such service possible. The Christian doctrine of non-resistance involved in the Golden Rule must be transmuted from non-resistance, as between individuals, to non-resistance as between the individual and the commonweal. In a word, it must be transmuted from blind serfdom into intelligent co-operation. The self-sacrifice for the common good, or *esprit de corps*, which constitutes the essential element of military organisation, distinguishing the disciplined army from an armed rabble, will then inspire the civilian, who will see that his self-interest is part and parcel of the communal interest.

Will a man then exploit his fellows for his own ends? No ; because such exploitation would constitute him, not a servant, but a despoiler of society. Will a man then demand from society such employment as he arbitrarily prefers, but which is inconsistent with his capacities? No ; because the satisfaction of such demand would constitute society his servant, instead of him society's servant. Will a man then demand from society remuneration inconsistent with the equitable appraisal of his service to society? No ; because such demand would be

equivalent to asking society to be dishonest to its constituents.

Will a man then risk his life to save that of his fellow? Yes, if he undertakes a vocation involving such risk. Will not a man so risk his life, from humane impulse, independent of his vocation? Yes, if his hereditary conformation so impels him; but such impulse will be extrinsic to justice. Will not a man's sense of justice to the community prevent the exercise of this humane impulse? If a man believes his own life to be of great value to the community, he may consider that risking it to save that of another person involves injustice to the community; under such conditions it may involve more courage and self-sacrifice for a man not to risk than to risk his life. The mere physical impulse we call courage is common to most men and brutes. Courage in its highest form is a very different thing.

Will a man's sense of justice then permit him to slay his fellows on the battlefield? Yes, if he believes his fellows unjustly assail his country. No, if he believes the contrary. How is the average man to attain belief regarding the justice or injustice of his country's cause? By applying his intellect to the facts which, on the conditions of an intellectual dispensation, would be honestly laid before him by the press, as the mouthpiece of the presumably honest people at the head of affairs. Will a man's sense of justice then permit him to adopt a military career? Yes, if such career does not debar him from acting according to his belief regarding the justice of killing

his fellows. If, as a military man, he has simply to kill at command, then a military career is inconsistent with justice, because a man may then have to kill for what he believes to be an unjust cause.

Can a just society punish offenders against its integrity? Yes. Why, as these offenders act as God wills? And the just society so acts in punishing them. If society obeys its intellect by establishing conditions imposed by intellect, those conditions are God's, decreed to overcome other conditions involving the criminal. So soon as a just society discovers means other than punishment of opposing the criminal, such society will, of course, adopt those means. On the other hand, so long as society is itself the greatest criminal, there is no ethics in its punishment of the individual. Then it is a mere matter of brute struggle between the two, and the weaker necessarily succumbs. How is a society to be just? First and foremost, by nationalising faculty and constituting each individual servant of the state. This involves nationalisation of land and means of production, because those who own such things are masters of the state. The next thing such a society has to do is to afford each unit equal educational opportunity of manifesting his or her special aptitudes, and to apply those aptitudes impartially in the public service. Such a society has to decide all its problems according to intellectual criteria, eliminating emotion, as the arch foe of truth, from such decisions. That society has to suppress the public advocacy of social concerns on any but intellectual lines. Given its fundamental

constitution of faculty-nationalisation and individual status as servant of the state, that society will depute, to a few picked brains, the administrative superintendence of its affairs. As these administrators will be rigidly controlled by the constitution and by intellectual limitations, their errors will at once be amenable to public scrutiny and rectification.

That society will, in no way, interfere with the individual's private life. So long as he honestly co-operates with his fellows as a contributor to the national "output," he will have no master but himself. On the other hand, in his public capacity, if he have children, society will rigidly exact its own rights in regard to those children and the woman who gave them birth.

The practical application of truth, by the individual and society, to the multitude of everyday concerns is not a difficult matter once we have thoroughly assimilated the prime conditions—faculty-nationalisation and its concomitants emanating from the scientific demonstration of human determinism. Apart from these prime conditions, to talk of social or individual justice in the manner of certain introspective *dilettanti*, as being an indefinable ideal at the mercy of each man's "conscience," is to babble aimlessly. Justice is not merely a phrase or vague idea, but is a *thing* as rationally definable as is a triangle and as obvious as a cheese. Those ancient philosophers who wrangled about justice had to evolve a *notion* by introspection. *We* have to define—and especially act—a *thing* emanating from the

same bases and identified by the same methods of inference as afford the physicist his experiences of truth.

Justice as the ideal of the visionary, and justice as the object of the practical philosopher, are two very different things.

As already indicated, deliberate injustice is equivalent to deliberate mendacity, and thus involves all essential moral evil. Like cancer, deliberate injustice is a morbid abnormality, only to be extirpated, in the case of society, by the equivalent of the surgeon's knife—political revolution. This revolution may be accomplished by gradual transmutation, or by catastrophe. By one or the other process it must come, because belief is now only possible through intellect, and involves our apprehension that the present social system constitutes deliberate injustice as the foundation of society. It is no use trying to evade, or closing our eyes to this stupendous revelation. God does not send that sort of thing to be juggled away by creatures. Any man who tries to shirk it, or to dispose of it by any means other than intellectually discrediting it to his own apprehension, manifests the essence of all moral evil now possible to humanity. Every honest man who intellectually recognises the revelation as truth must co-operate to ensure social action of the truth. The man who thwarts the realisation by action of the truth is party to social crime, and, as party, is as personally guilty as though he were the sole agent. His guilt is measurable by his volition, not by his power to enforce it. He wills

the crime as completely by conniving at it as he would by executing it. Relatively to his fellows, he elects freely, and by his fruits he and his like will affect the issue—cataclysm or peaceful transmutation.

Of course, the individual may say he cares nothing about social crime, whether it be remedied by one or another means, or not remedied at all. He may say he cares about nothing but his own gratification, and prefers things as they are. That is his own affair. I surmise I shall be able to show that such philosophy entails possibilities which may well cause the individual, as a self-sollicitous entity, to hesitate about acting it. I think I shall be able to show him that though there is no such thing as freewill, there is such a thing as responsibility entailing consequences reaching, for himself, beyond the terrestrial stage of existence. Of course this is a low ground of appeal, but not lower than the assumed ground of action. Depend upon this—for those who will not be guided, Nature will always have the scourge. Her decrees have to be executed, however repugnant to the agents. If the penalties of theology are abolished, science reveals substitutes. So far from annulling morality, science has vastly intensified its reality. So far from abolishing the expectation of future existence, science has brought it well within intellectual assurance. How science has done this I hope to show in later chapters.

Truth-sensation, in itself, has no ethical significance. To have such significance, it must be acted. Accordingly, truth-sensation, as the mere negation of existing belief—as, for instance, in the case of merely

destructive Agnosticism or "free-thought"—though it may have ethical significance in regard to the individual who affirms and otherwise acts it, may be, in regard to society, an unsatisfactory manifestation, to the extent that it substitutes no affirmative truth for that it destroys. Mere negative belief, though often necessarily preliminary to, and always involved in, the establishment of new affirmative belief, can only be considered a bridge to socially efficient truth. To be really profitable, truth must be affirmative. Though negative truth involves moral action in its affirmation, its practical application constitutes what I may term atavistic activity—that is, activity tending backwards towards primordial reflex response, instead of forward in the direction of discriminative volition. To illustrate this point by an extreme instance, assume all science destroyed by some stupendous Agnostic negation, as, say, theology is now destroyed. And assume men acting this negation by practically repudiating science. The consequence, obviously, would be atavistic reversion. Our great negation would ill compensate us for the loss of our affirmation.

Believing falsely is, from the evolutionary standpoint, "fitter" than merely believing negatively. Denial is a good thing as preliminary, but, as finality, we must have substitution, not annihilation. The mere iconoclast is socially tolerable only as preparation for the constructive renovator. As preparation, the iconoclast has, no doubt, a great function in the social scheme. Still, many are too prone

to overlook that his undoing must be superseded by fresh doing before society is really benefited by his efforts. A society divested of positive beliefs is in a more parlous state than one holding wrong beliefs. To the extent that he merely deprives society of beliefs, the iconoclast impoverishes society. Only when he, or somebody else, as constructor, provides fresh "images" in place of those lost does the iconoclast's destruction approve itself as socially beneficial. Contemplating one great achievement of the iconoclast—the destruction of emotive religion, this demolition has only yet turned men into hypocrites. Before we have them again honest, we must supplement the work of the iconoclast by providing new "images." Nature will only tolerate a credal "vacuum" as *interregnum*.

According to the scientific demonstration that truth is simply what is believed, morality is thus definable—action according to belief. Morality is neither more nor less than this. For, were it anything else than action according to belief, morality would be opposed to normal action as demonstrated throughout the whole of human voluntary activity, all which activity is obviously merely the motor resultant of belief. To illustrate this, in regard to humanity, we have only to consider philosophy, science, industry, invention, or any common act of volition, all of which are only possible as the resultant of belief. No productive worker of any sort can exist but as manifesting this fundamental condition of action according to belief.

Now, if we grant the above proposition regarding morality, we imply another affirmation—that morality may be “fit” or “unfit” according to its conformity with “fit” or “unfit” truth, or, respectively, with intellectual (fit) or emotional (unfit) truth. As already indicated, emotional truth is unfit: first, because it is based on personal prepossession; secondly, because it exists to normally intelligent people only so long as intellectual truth is not within their cognition; in other words, so long as they are ignorant.

The ethical resultant of “unfit” truth is what we call expediency. This “unfit” resultant emanates from our liking to ensure a specific object, irrespectively of its warrant as an issue of intellectual truth. As being merely expediential, any action exemplifies “unfit” morality. Even when expediential truth is exercised to attain the realisation of intellectual or “fit” truth, if the expediential activity itself does not emanate from intellectual truth, such activity represents “unfit” morality. This involves the proposition that a morally “unfit” means cannot be morally adopted to accomplish a morally “fit” end. To take an illustration: If we believe that we should do to others as we would have them do to us, it is morally “unfit” to enforce the precept by the authority of a man-god, belief in whose divinity and mission we cannot intellectually authenticate.

Thus, all *deliberate* action not the consequent of belief is immoral, and actions inspired by the

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emotions (love, hate) are neither moral nor immoral, except to the extent that they conform with or oppose belief. Even self-sacrifice through love of another is not moral unless the sacrifice is justifiable as the issue of belief. Of course we usually like people who make such sacrifice (really a form of self-gratification); still, our liking has nothing to do with moral measurement. Similarly, we dislike other people who sacrifice their fellow-beings to gratify hatred; still, our disliking has nothing to do with the moral character of the activity. Morality deals with nothing but justice and injustice, and these are decided solely by intellectual belief. The only objects to which we can, as ethicists, apply the emotions of love and hate are, respectively, what we intellectually apprehend as justice and injustice. We must love the one and hate the other. This application, as I show in this work, involves, in social affairs, all the practical issues of self-sacrifice through love of persons.

The question arises: Why should we be moral? Many people answer: Because it is expedient to be moral. These people think they adequately answer the question by showing, to their own satisfaction, that society can only exist through the application of certain restrictions to the individual. The answer is inadequate, because it assumes that everybody is concerned to preserve society. But the fact is that very few people are so concerned. The majority care very little about society except as the object of their exploitation. We may say that the people who dominate society are those who make least sacrifices

for it. The successful politician or business man, if he conforms to moral obligation, or what passes as such obligation, does so, not through concern for society, but for himself. My never-to-be-forgotten friend, the late J. F. Nisbet, wrote me: "I don't care what happens to society." Nisbet was too much a real man to dissemble on that score. From his standpoint, he had no reason to care about society, or to suppose that whether he cared or not would make any difference. He considered that what he called Nature would do her work independently of him, and that it was no concern of his, during his short span, whether the work was being done in one or another way. The mountain of evil was too vast for him to move, so he was content to look at it and point out its various unsavoury aspects to his readers. Inevitably, the downfall of emotional belief must involve Nisbet's standpoint. The dispiriting feature to me is that, under the conditions, but an infinitesimal few have the moral fibre impelling them to avow the standpoint, but make pretensions utterly inconsistent with honesty. At present we are, undoubtedly, a nation of hypocrites.

The vast majority of folk, whatever be their professions, manifest by their actions the lack of concern which Nisbet was honest enough to avow. The common purview cannot transcend the personality and its immediate surroundings. Even what we call patriotism, aspiring to territorial aggrandisement and ostentatious display of brute power, is merely a variant of the narrow personal incentive. At root,

it is but the concern of a band of savages, each of whom finds his personal interest in co-operating with the rest for plunder. Again, when we contemplate that section of the public which, of all others, might be expected to manifest concern for really human—which is solely ethical—development, we find nothing but veneered selfishness. As a body, clerics are a partisan clique solely concerned to preserve their social privileges, professional pretensions, and pecuniary acquisitions. The average cleric is nothing better, at root, from the ethical standpoint, than the average stock-jobber or politician. That the one “bulls” shares, or party-fads, while the other “bulls” exploded superstitions constitutes no real differentiation. If the professedly spiritual element in society is thus dross, what can we expect of the professedly carnal? Why should we be perplexed to account for a debased literature, art, and public life when we have neither religion nor morality? Take up your daily paper and listen to the music of the social spheres! Hear the dead clang to-day, *da capo* to-morrow and throughout the years—Grasp! grab! gold! eat! drink! play! brawl! rend! cajole! outwit! cringe! trample! betray! cant! gammon! pretend! Why should we be moral? I say, to alter the social gamut; to afford us some human progressions; to give us something worth living for as thinking beings.

As illustration of the intellectual and moral degeneracy of this country, I may here comment on some facts which have just affected me poignantly.

Various leading journals have recently been stirring the country against the iniquity of the methods and incentives which have provoked the present war in Africa. No words were too strong for these journals in which to denounce the injustice of this war. The moral sentiment expressed by these journals was of such a concentrated character that I thought, surely now, if ever, some moral *action* will show its unaccustomed head. Instead of this, these journals demonstrate themselves the most unabashed repudiators of morality in the land. Immediately the war they have just denounced as unjust and wantonly provoked is declared, they help to swell the chorus of howls for its unflinching prosecution, and applaud with all the zest of seasoned Jingoës what they call the heroism of our professional homicides. Notably, some of the leading popular exponents of what is misnamed Socialism—people who make it their business to rail against the aggression of the capitalist, the enormity of the sweater and lead-poisoner, the rule of might in all its guises—show their love of liberty and hatred of aggression by shrieking hosannas for extirpation by the sword of a people's liberty to choose its own laws, and for the compulsory imposition of laws which a more powerful nation prefers. When I consider what Socialism would mean under the auspices of these emotive regenerators, I congratulate myself that they will probably be in their coffins long before Socialism is born.

The intention is, morally, the deed—to connive

at an action is to commit it. Unjust homicide is murder. Homicide that, to our belief, is unjust, is, so far as we are concerned, unjust. Those who believe that this Boer war is unjust and who stand shoulder to shoulder as "patriots" are, from my standpoint, murderers quite as demonstrably as is the wretch who swings from our gallows, who in many cases has the excuse of disordered passion for what these moral "patriots" do in cold blood.

Personally, I have small regard for what is conventionally called courage. I recognise that rats, pigs, spiders, almost the whole brute world can die in fight quite as nonchalantly as can the "gentleman in kharki." What, to my apprehension, the "gentleman out of kharki" cannot do is to discriminate between righteous and unrighteous incentives for killing. To my idea, this discriminative faculty in action differentiates the hero from the brute. Merely to hack and hew as gratification of the brute instinct, or as professional calling, is to me extremely contemptible, and I think it is one of the easiest things in the world to die. My idea of combative heroism is to stake life for a just cause and to kill for no other cause. And by a just cause I mean a cause I believe just. Rather than die for my country in an unjust cause, I would die against her on behalf of those she wrongs. I would no more be a hireling to kill unjustly by my own hand, for the sake of professionalism, than I would be a hireling to murder by deputy, for the sake of "patriotic" conformity. I believe that he who tolerates injustice by his country

is her enemy. I believe my duty, if I pretend to be a man, is to fight first for justice. If I shirk doing so, I am to my own knowledge a moral dastard and social degenerate.

I am here ignoring whether the war in Africa is just or unjust. I am only dealing with the moral iniquity of those who believe the war is unjust and stultify their belief at the bidding of expediency. They typify the poison now surely rotting this nation. The human brute who is honest and ignorant has no moral account to square. The intellectual knower who belies his convictions at the bidding of his inclinations has a credit with the Devil and a debit with us, and I surmise that the settlement of his account will entail a harder wrench for civilisation than it has yet endured. Our empire has been founded on brutism and honest beliefs. We *were* honest. Evolution now constitutes us dishonest. Modern intellectual development is involving the destruction of beliefs and substitution of others; but it is not involving action corresponding to the new beliefs. The issue is: moral sentiment and moral rottenness. We shall stand or fall by what we do know, not by what we did know. If the brain of the country is corrupt, the brawn will not save it.

Something more than expediency, or even concern for society, is needed to authenticate morality. Even assuming we all recognised the dependence of morality on action according to belief—which few of us do at present—something more than this recognition would be needed to establish morality. What

is this something? I say it is demonstration of a lawgiver above human intellect. Morality, without God, can at the best be a mere exotic. We need morality as a hardy evergreen.

It may be asked: Granting we demonstrate God's existence, why shall we assume that God is any more authority for morality than for immorality? God, *ex hypothesi*, having created both, why shall the rogue, any more than the honest man, consider he is affronting God's decree? The reply is that the rogue, if he be endowed with normal perceptivity, cannot believe that his action is right, while the honest man can so believe. All here is a question of belief in the quality of specific action, not of belief in the fact that God has created good and evil. If we do evil on the ground that God is its Creator and has therefore decreed it, we act to gratify our likes, not to satisfy our intellect, which tells us that, though God has created both good and evil, evil is the wrong thing, good the right thing for us, individually, to do. Accordingly, as we are endowed with this power of discrimination, God has decreed—whatever be the fact regarding God's creation of good and evil—that we personally shall select good. Moreover, as we only recognise by means of intellect this demand for our personal consummation of good, we can only determine what specifically constitutes good by applying intellect to the determination. If we rely on intellect to authenticate God as the Authority for good, we must also rely on intellect to authenticate what constitutes good. If

we thus employ intellect, as I show in this work, good resolves itself into justice—the doing to others as we would be done to by them, subject to the proviso that our desire for others' action to ourselves is conditioned by "fit" belief—that is, by apprehension of scientific right.

Of course, a multitude of people, lacking "fit" interaction between volition and desire, will be unable practically to effectuate their discrimination. I myself do not pretend to be able fully to effectuate such discrimination. I daresay I am no more, perhaps less immaculate than the majority of my fellows. Recognising my and their limitations, just as I recognise the supreme truth of the ideal I propound, I see the prime necessity that society itself shall be rendered just before the individual can become just. I see that society itself, as God's machinery, must exercise compulsion over the individual in order to secure the prevalence of justice. Therefore I advocate the Socialistic dispensation indicated in this work.

It will be advisable here to offer a few remarks on the all-important question of freewill, with which I shall deal specifically in a later chapter, but which is really dealt with, by implication, in the whole of my philosophy establishing a universe emanating from and dependent on one God. The only conceivable freewill, as between the Creator and created, would involve that the created could act against the determinism or will of the Creator. Such a freewill is not worth a word to any thinking creature. That

the creature can only act as the Creator wills or determines is self-evident, without scientific confirmation, which, as I show in this work, is too overwhelming to be questioned. In these days, only two classes of people are likely to contend for unconditioned human volition. The one class, though convinced by common sense and science, may prefer denying their intellect rather than accept the ethics and economics which are the incontestably logical issue of the truth that God, not man, is the Author of human faculty. Such upholders of freewill will be simply selfish hypocrites who want to retain what ignorance has hitherto sanctioned as individual right of ownership. The other class who may contend for freewill will be superficialists ignorant of science, and accepting various vague and unanalysed sensations as proofs of a fact to which they have no real relevancy.

The scientific doctrine of determinism, as I enunciate it, does not affect individual responsibility, whether as between man and man, or between the man and society. Though God conditions every individual, as no individual knows what is the predetermined issue of his conditions, and has intellect and the sensation of volitional liberty to regulate his actions, he is answerable for those actions. Thus, practically, he is a free agent. But this imputed or relative freedom that involves responsibility for him, also involves responsibility for every other individual, and for all individuals collectively, as society. If society wrongs the individual, it is as much a criminal

as he is if he wrongs his fellow-man, and he is as well warranted in demanding justice from society, as society is warranted in demanding justice from him. If the balance of power is in favour of a section constituting an unjust society, then it is the business of the justice-seeking individual to work for a preponderant majority able to apply the law of might for justice and so overthrow the section applying the law of might for injustice. Whether or not the individual be held answerable in a future state, he is certainly answerable here and so is his society. Personally I am pretty well assured that the individual will be held answerable in a future state. This I am, because I believe in a future life, and that there will be evolutionary continuity between it and this life.

Let me put the case of relative freedom in a familiar form. Suppose you are determined, why imagine you are determined to be a selfish schemer for your own petty ends, rather than an honest user of your faculties for the good of your fellows? Your freedom is involved in your consciousness of ability to strive, not in the success or failure of your striving. God has made you feel that you can help or thwart an end, and has given you power to discern a right or wrong end. What does it matter, so far as your actions are concerned, that God determines them? Why shall you not act on the assumption that God has decreed you to be a just man? Is it not more rational to act on that assumption than on the supposition that God has decreed

you to be a rogue? Suppose it is more agreeable to your appetites to be a rogue, is it not more agreeable to all that differentiates you from the brutes to be honest? How do you know that, if you function at the brute-level here, you will not lose more, later, than you gain, now? If you do not believe in a future life, is it not advisable that you should seriously consider the evidences in its favour? Remember that nature never excuses ignorance! On the low ground of expediency, it will be a very poor business for you, assuming a future life, if you stake all on sensual gratification during your little span on earth. Your great achievement, as an animal, on earth, may keep you alive in human history, it won't do much for you in post-terrestrial evolution. There, your credit may be only affected by your terrestrial activities on the human level. Your money and acres are great things on earth; but think how soon they will be out of your grasp, and that your consciousness of freedom on earth may have, as analogue in a future state, consciousness of having misused that freedom. That evolution stops, for you, with your life on earth, is, I venture to say, against its own evidences. You prefer the sensual "bird in the hand"? Good! But at any rate scrutinise those evidences. You will find them in this work.

Of course the above statement of the case does not affect the demonstration of absolute determinism, as between God and the creature. As I shall later show, the sensation of liberty, involving what we call choice, is essentially distinct from the act of

volition with which it is almost universally confounded. What we commonly call choice is desire and counter-desire. This is a matter of body. The actual volitional consummation is a matter of soul, responding directly to God. It is out of time and we only know it, as physical experience, as the particular action. The modern demonstration, as I offer it, of absolute determinism has no moral significance except as revealing, beyond earlier possibility, the nature of justice. Far from abolishing responsibility, I surmise that the new doctrine of determinism will so intensify it that a number of ostensibly moral folk will find the new morality too exigent for their liking, and will indulge their prejudices by trying to ignore it—but in vain! It has come to dominate the world. I may here incidentally refer to the question of a future life and penalties therein for earthly transgressions. Assuming there to be post-terrestrial existence (for which I hope to offer good inferential evidence) I do not see why penalties should not be exacted (not as God's visitation on creatures beyond His control, but as evolutionary continuity) against beings who, on earth, manifested their discrimination as the deliberate repudiation of intellectual guidance. If various states of suffering exist here, as the consequence of such repudiation, I see no reason to suppose that corresponding states will not occur in a future life. Our punishment of the forger, garrotter, murderer is as much God's as would be any form of its future continuity. Why shall our penalties here against

offence to the sense of right not persist in some form in a future dispensation? Though I entirely repudiate the theological doctrine of sin, implying power of the creature to thwart its Maker, I by no means deny rational ground for assuming that a man's actions on earth will affect him post-terrestrially.

If such future suffering do occur to the individual, I believe it will be apportioned, as evolutionary continuity, infallibly according to his terrestrially exercised potentiality of discrimination, taking into account all hereditary and environmental conditions affecting such exercise. But, it may be asked, as God has created the conditions, as well as the discriminative power, how can God justly hold the individual answerable for the consequences? I ask the counter-question: How can God justly create the conditions involving the terrestrial punishment? Wherein lies the difference as affecting God's justice, whether the visitation is here or in some future state?

I simply pretend to apply intellect to facts within my experience. With what I cannot reach by intellect so applied, I do not pretend to deal. I hold no case at present, though I may do later, to prove God just any more than unjust. I simply, at present, hold a case to prove that God has decreed what we apprehend as justice to prevail over what we apprehend as injustice, and that it accordingly behoves every man to practise justice. So applying my intellect, I discover that God is outside conditions, and is therefore outside what I apprehend as justice.

The theological doctrine of sin implies that the

creature can thwart the Creator and can be saved from the Creator's vengeance only through believing in a divine man. My doctrine of post-terrestrial evolutionary continuity of earthly activities implies that the creature cannot thwart the Creator and, corollarily, imputes no human passion to the Creator, thus denying any office for an intercessor between the creature and the Creator. As there is nothing for the creature to expiate, as between him and the Creator, there is nothing for which a saviour can atone. To require a saviour, as between man and God, you must deny any rational concept of God, to say nothing of denying the whole body of science.

I hardly need insist on the deadening effect on moral effort exercised by a doctrine which excludes—as do the theological scheme of salvation and denial of intellect—the individual's volition as a factor in his ultimate destiny. We see the results of this doctrine in the ridiculing of morality and justice and the glorification of the profession of carnage and blind, unreasoning obedience, by what calls itself the patriotic press ; in the practical exclusion of morality and justice from our international concerns and internal politics ; in the reckless pursuit of sordid aims and sensual gratifications by the general public ; in the cynical indifference to honesty of a special class pretending to devote their lives to the service of God. In a word, we may recognise the results of the theological doctrine of sin, in the corruption permeating the great Christian nations, and in the seismic rumblings portending a general social upheaval.

There is now only one saviour for these nations. It is intellectual honesty and its resultant—justice. With the questions of morality, post-terrestrial existence and the attributes of God, I shall deal more fully in other chapters in a later volume. I will now, as further preliminary to such future discussions, direct the reader's attention to the question of God's existence.

I have already incidentally referred to the subject in the chapter dealing with Monism, and shall, later, in various chapters treating of the philosophy of science, and in special chapters devoted to this supreme question, thoroughly, I hope, even to the satisfaction of the pure objectivist, establish the fact of the existence of God, as an entity over and above the universe of sense and spirit. Here I shall treat the subject mainly from the dialectical standpoint.

Before offering the consideration, I may devote a little more attention to the question of the origin of belief in God. As already stated, I do not care how the belief has arisen. All I care about, in the connection, are the present credentials for the belief, which cannot be affected by its origin. Nevertheless, as laborious study has been devoted to determining the origin of the belief, I may state that I hold with those who believe that religion has originated as ancestor-worship, but, that I also believe that intuition of God, as mystery transcending human experience (to be later manifested as animism, the spiritual germ of religions), was the origin of ancestor-worship. On the other hand, I do not think there is ground for

assuming that the idea of entity, not of concrete human origin, constituted, until an evolutionally late period, a factor in religion. Thus, though there may have been no originating conscious idea of such non-human entity, there was unconscious intuition impelling the primordial savage—whether through fear or affection does not matter—to a sense of obligation transcending his immediate concerns, and this sense of obligation carried the germs of recognition of a power over and above the universe, such as we apprehend as God, deference to whom constitutes what we understand as religion.

I find no more reason to doubt the evolution of belief in God from such a rudiment as ancestor-worship, than I find to doubt the evolution of humanity from the unicellular type. On the other hand, I no more doubt my present evidences for the existence of God, because I accept ancestor-worship as its originating rudiment, than I doubt my present evidences for my own identity, because I accept my amœboid ancestry.

The investigations of anthropologists and mythologists, as to the origin of religion, can only, as touching the validity of their creeds, vitally affect those religionists who contemplate the issue from the narrow standpoint of their own creeds as special revelations outside the conditions of evolution. Such people may well shudder at the mountain of evidence opposed to their petty imaginings.

Whether it be ancestor-worship, stone-worship, Jehovah-worship, Christ-worship, or the God-worship of scientific belief, the essence of the revelation is the

belief itself, not what is believed. God decrees that truth shall change and that action shall conform with belief. What affronts these conditions cannot be religion. Religion for us is a matter of action, conforming to "fit" belief regarding God. Thus, it embraces scientific morality.

If belief in the existence of God exists *for us*, that belief must arise from a method of verification different in *kind* from that imposing the belief on the primordial believer, or even on him of a century ago. For us, the belief must arise through intellect applied to the facts of science, not through emotion applied to the myths of imagination. For weal or woe, evolution has now cut us off from emotional belief.

We only know one universe, as an organism governed by orderly conditions. This universe, according to inference from natural science, requires to be accounted for by the assumption of a cause not that universe. Just as we are mentally compelled to account for phenomena within that universe, by the concept of causation, so we are compelled to account for the totality of phenomena by that concept. If we arbitrarily isolate the totality (as an uncaused universe) from the condition of causation, we stultify the application of causation to the details—in other words, we stultify natural science and all common experience of relationship, which we only cognise through the concept of causation.

Thus, the concept of causation drives us to the concept of the uncaused. This uncaused I call God, and this God is beyond anything we can apprehend as

limitation. But, we can *imagine* other gods, similarly uncaused and unlimited. Are there such gods because we can imagine them? No; there are no more such gods because we can imagine them, than there are flying pigs because we can imagine a flying pig. The sensation of truth is quite distinct from the sensation of imagination. As already indicated, the sensation of truth, as we now have it, is a product of the evolutionary differentiation of primordial sensibility into intellectual sensation of actuality. Imagination and emotion are other such products. What we now mean by truth is intellectual sensation of actuality derived by elaborating sense-experience through reason. We can only know what we believe, and we can only believe through experiencing the product of this elaboration by reason.

Accordingly, as we only sensorially know one universe, we cannot infer that there are other universes. Though we can and must infer the unknown uncaused from the known caused, we cannot infer an unknown from a known caused. So soon as we discover any new manifestation of the caused, it becomes part of the old caused. Again, as what we do not know to exist, for us does not exist, and as what does not exist for us does not logically exist at all, no universe, other than ours, exists. And, as we only know the one God through knowing the one universe, there can only be the one God.

Whether we apply imagination to creating a plurality of gods, or to creating any ordinary supposititious contingency not bound to sensory experience,

the result is the same—affront to the prime conditions on which truth, as an organism, is possible. The self-created universe of people who profess to be thinkers is nothing but the anarchic license of imagination.

To contend that something may exist that we do not know to exist is to stultify the demonstration that knowledge is only belief, and that we can only believe what we intellectually feel as truth. When, in ordinary affairs, we say something may be which, for the time, we cannot verify, we imply that the assumed contingency is possible as a happening within our experience of the universe. But if we say there may be more gods than one, we imply that we know there is more than one universe analogous to ours. For, as we only know the one God through knowing our one universe, if we admit the assumption of more than one God, we stultify the condition—knowledge of the one universe, by which only we attain knowledge of *any* God. Pigs cannot fly, because no pig within our knowledge ever has flown. More universes than ours cannot exist; for if a universe other than ours were to exist, so soon as we apprehended its existence that universe would be ours.

Obviously, so soon as we have attained the truth that there is one God, we have attained the truth that what, as like truth, exists for us as moral right, is determined by this God *as* that right, and that what opposes that right is so determined as wrong. Then it is for those who believe in this one God to decide,

within their limitations, whether they will adopt the right or the wrong, and to recognise that the authority for both, as right and wrong, is the one God. If they believe that this God decrees the wrong to prevail, let them act it. If they hold for the prevalence of the right, let them act it. If they believe God and devil are two words for the same entity, let those who prefer devil act the wrong, and those who prefer God act the right. I am for God against devil!

It will be seen that the practical application of scientific religion is impossible so long as we have no socially recognised standard of truth, and it will be obvious that there is no such standard available except that I indicate, involving logical inference from sense-experience. The immediate object of genuine reformers should be to secure a majority of intelligent people in favour of the social recognition of the scientific principle. Then, when an adequate constituency is created, the transition from the present to scientific social conditions can be readily and peacefully accomplished. Once established, to public apprehension, the only conditions of truth compatible with modern psychical evolution, there will be a believed religion and an honest social dispensation. The latter is the necessary consequence of the former. Under our present system involving no social apprehension of a scientific standard of truth, all is a chaos of passions, sentiments, and prejudices, and the nation is the tool of any enthusiast, cynic, or rogue able and willing to excite these non-rational incentives for his own ends.

The esoteric Christian notion of a man-god, as

being sacrificed to appease his father, springs from a very primitive and even now (among savages) common belief in divine men as sons of God, yet capable of actions, or lack of them, demanding the killing of those human divinities. Anthropological works dealing with religion teem with such instances. In the case of the great Christian sacrifice, this fundamental idea, elaborated by Judaism, would work out thus—justice is the supreme attribute of God, the Father. It has been offended by man and must be satisfied by God through the sacrifice of God's Son, as God Himself. Scientific religion supersedes this idea by one conforming with modern sensation of truth. The scientific idea runs : God decrees justice to be practised by men, quite independently of the question whether justice is an attribute of God, which, to our apprehension, it could not be did an omnipotent entity exemplifying justice need to punish himself, by sacrificing his son, for the offences of mere creatures. If the offences of creatures need self-retaliation by the Creator, they involve self-injustice by the Creator. This injustice is not annulled by the self-retaliation. A just Creator, to our apprehension, is inconsistent with the Christian doctrine of atonement, though the consistency no doubt existed to the mind of Judaistic Christian anthropomorphism. The only sacrifice demanded by scientific religion is that of animal propensity for self-gratification at the expense of intellectual perception of justice. The newer doctrine of sacrifice conforms with the newer conditions of belief. Because the older doctrine is

unfitted to modern environment, it has become incredible; and conversely, because it is incredible, it is unfitted to modern environment. As it superseded other doctrines, it must now be superseded.

Professing Christians practically ignore this esoteric Judaistic idea of justice as the basis of their faith, rendering prominent, instead, a doctrine of love. Of course, this doctrine of love hangs, as regards validity, on the doctrine of Christ as being a self-atoning God, coequal with the Father. If we cannot believe the basical doctrine, the superstructural one, with it, becomes untrue. As will be fully demonstrated in this work, and as has been partially demonstrated in the preceding volume, this basical doctrine is utterly opposed to the whole of modern science, modern practical experience, and modern common-sense. Accordingly, the Christian doctrine of love must be absorbed by the modern doctrine of justice, renovating for this age the esoteric basis of Christianity, and thus preserving evolutionary continuity with the "germ" from which religion originated. As shown in this work, the modern doctrine of justice practically involves the Christian doctrine of love, while rendering it conformable with modern conditions of belief by transferring it from the emotional to the intellectual arena of authentication, and appropriating its emotion on behalf of an ideal, in place of the earlier sensual object.

Religion, as intuition of God, is really a single organism in multiform pattern. There is no such thing as a new religion, any more than there is a new

universe. There is merely metamorphosis of religion. So soon as one form of religion is not believed, another must take its place.

Anthropology, mythology, ethnography, archæology now enable us to establish, beyond rational doubt, that every modern and ancient religious observance and belief, and numberless secular ones, had a "germinal" origin in prehistoric religious ideas and rites. We can now trace the evolution of religion as conclusively as we can trace the evolution of the human organism. All the concepts and rites set forth in the records we call the Bible are now to be identified as genealogically bound to the intuitions of the paleolithic savage. That the Christian faith has been "evolved" from a "germ," not created as an "adult," nobody with any pretension to honest impartiality, culture, and intelligence can deny. On the other hand, what this "evolution" really means—whether in regard to a physiological or a mental organism—I surmise I shall be able to place in a different light from that through which the question has hitherto been viewed. When I have done with it, I think the concept of "evolution" will itself have evolved.

The above remarks regarding the origin of the notion of God apply also to the origin of morality. Just as the notion of God originated from the bare sense of mystery transcending human experience, so did the notion of morality originate from an analogously inchoate sense of compulsion transcending mere appetite.

In regard to all evolution, the fundamental crux is *predisposition*—what, in the realm of biology, we understand as the origin of variation. Conventional evolutionary theories assume this predisposition as given, and many evolutionists think they obviate the necessity of supernatural implication if they merely systematise the observed variational sequences. The materialistic scepticism permeating modern activities is a product of this inadequate induction.

“There is nothing new under the sun.” The primeval savage had, and the modern one has, in totemism (belief in descent from animals and inorganic objects) their “evolution” as decisively as the modern Darwinian has his, and the one “evolution” is no more finally, absolutely true than the other! All we have to do is to emulate the savage in acting, not belying, our “evolution.” Say what we like about the savage, he can teach us something regarding morality.

CHAPTER II

ORGANIC DETERMINISM

BIOLOGY tells us that the human being has all his innate potentialities for mental and physical development embodied in two combining nuclei, respectively called sperm and germ. After the combination or rather coming together of these nuclei in a female organism, a process of cellular growth in ordered directions occurs through the inherent activity of the combining nuclei as a fertilised ovum. This ordered growth eventually involves the infant endowed with the rudiments of all the hereditary capacities of the adult. Nothing mental or physical that is not embryonate in the infant can exist in the adult, whose mind and body are thus irrevocably determined before he is born.

Physiology tells us that all visceral, sensory, and psychical activities depend on nervous matter correlated into multitudinous interacting lines of communication. Destroy or injure these lines of nervous intercommunication, we destroy or perturb the psychical, sensory, and visceral activities of the organism.

Physiological psychology tells us that mind is a product of external excitation affecting interacting nervous structures. Thus, these three branches of investigation posit absolute determinism. There is no room for a spontaneous factor, as freewill, so far as they are concerned.

I shall supplement the notions of biologists regarding the determining cell by certain inferences involving a metaphysical amplification of the conventional notions regarding matter. Applying these inferences to the biological factors, I shall rationally establish the existence of a life-principle, distinct from the matter-elements of the organism. This life-principle is the soul. When I write of the biological germ-nucleus, in this or any other chapter, the reservation must always be understood that I am going to transcend all biological concepts of matter, and that I deny that the germ-nucleus, as implied by biologists, is at all a real factor in procreation or hereditary determinism. This applies to all biological definitions of constituents of the nucleus (biophors, determinants, pangenes, biological units, or what not). I only adopt such materialistic terms for convenience of exposition pending the statement of my own metaphysical inferences, to which I must lead the reader by the ordinary materialistic pathway.

Now, as this vital factor, the biological germ-nucleus, conditions the structural potentiality of the organism, it necessarily conditions the brain and nervous system through which the organism is conscious. Thus, this vital factor conditions the struc-

ture of the thinking factor, or what we commonly consider the thinking factor. Moreover, beyond conditioning the structure of the thinking factor, the vital factor also qualitatively conditions the experiences of the thinking factor. Though this vital factor does not think, it makes thinking, as the feeling of the mechanism we call the brain. The manner in which the mechanism shall respond by consciousness to specific stimuli is determined, at every moment, by the vital factor. Let me illustrate this by what I call unsymbolisable sensation. I see a certain object which I call, say, a stick. But, before I cognise it as a "stick," I perceive it as unsymbolisable sensation—as something outside "me." I do not actually differentiate this unsymbolisable sensation, because habit now compels me instantaneously to associate it with the concept "stick." But, we have psychological grounds for supposing that the infant's visual experience of the stick is something approximating to the unsymbolisable sensation.

This unsymbolisable sensation is what the vital factor imposes on the thinking factor. Not only is there unsymbolisable sensation behind mere sensory impressions, but the same impulse of the vital factor is behind every thought, emotion, volition. Whether it be the ratiocination of the philosopher, or the simple sense-percept of a child, it equally exists only through special *timbre* impressed by the non-thinking but thought-conditioning vital factor, or soul. Thus, what we call truth is not something that we, as it were, extort from nature, but it is something imposed

on our thinking mechanism, as unsymbolisable sensation, before it becomes the actual experience which we feel, as truth. What we discover as new truths are thus really changes in intellectual sensation, conditioned by changing unsymbolisable sensation imposed by the vital factor. Thus, our "knowing" is done before we are aware of it, and we do not know better or worse, but only differently.

The vital factor, as a germ-nucleus, or soul, evolves from the potential to the active stage of its terrestrial phase of existence. This development involves the incorporation of what we call inorganic matter as the growing personality. In biological terminology, the biophors, or vital units of a germ-nucleus, are integrated as determinants governing the hereditary characters of the organism by giving the vital impulse to determinate growths of somatic cells. So long as these biophors, constituting the soul, or life-factor, are associated with their non-living pabulum, or inorganic matter, this pabulum, as somatic cells, tissue, muscle, etc., performs the multifarious offices involved in physiological life. Among these functions is what we call thought in all its aspects. Accordingly, what we understand as the personality, or thinking entity, is only an issue of the vital entity, or soul. The immediate factors involving personality are the somatic (nervous) products of biophors and environment. On the other hand, as a specific correlation of biophors, as a soul, determines the potentialities of a specific personality, we may assume as reasonable speculation (as I shall later show in

detail) that the specific biophoric integration, or soul, being ante-cosmically determined, energises beyond cosmic or terrestrial conditions, and that, consequently, the particular biophoric integration continues indefinitely to condition personalities, in conformity with ante-cosmic determinism, through various media. In fact, looking at this point from the standpoint of ordinary empiricism, as we have no reason to suppose that we are acquainted, through experience, with a tithe of the constituents of our immediate externals (witness the recent discoveries of argon, helium, etc.), such post-terrestrial activity of biophoric integrations, or soul, might, quite conceivably, involve a post-terrestrial phase of personality within terrestrial conditions, and yet outside our present apprehension. We have now a specific consciousness affording us specific experiences. Outside these experiences is, to us, a blank. This consciousness is a product of the soul, energising through particular media. Assuming these biophoric correlations (soul) were to energise through other media (which may now exist immediately about us, though beyond our perceptivity), the resulting personalities would perceive under their conditions, as we do under ours. This would merely involve that their phantasmagoria differed from ours, while the external reality about us both might be the same.

Current biology starts from the assumption of physiological life as an existing fact ; it does not attempt to account for the origin of that life. Certain material "germs" containing all the potentialities

of future terrestrial organisms are assumed as the fundamental biological data. On this basis, various elaborate systems of speculation, culminating in Weismannism, have been built. All these hypotheses vainly pretend to exclude teleological determinism. Like the physical hypothesis of atoms, the biological hypothesis of biophors ignores the basical fact, that matter is not what we subjectively sensualise as substance, but that it is an emanation from Deity which we cannot perceive as reality, though, to which we are inevitably driven, as inference, from what, through sensuous illusion, we imagine we can perceive as reality. We must deal with this factor behind our sensuous perceptivity, if we are to attain intellectual satisfaction regarding physical and biological fundamentals. Our conventional notions of matter, whether applied to biophors or atoms, must lead us to false conclusions so soon as we utilise them as direct solvents of fundamental issues regarding living and non-living products of creation. Matter, in our conventional sense of inert stuff, does not exist. All matter is life, and life is of two types—physiological and non-physiological. Cosmical life, physiological and non-physiological, from my standpoint, had its ante-cosmical analogue. This involves that all cosmical phenomena exist, potentially, as a product of Divine Will. What we apprehend as time has no significance in connection with this process of extra-phenomenal, or supernatural, volition. Present, past, and future are all as one in that connection. Only when these initiative potentialities, as cosmical actu-

alities, establish relational states, do present, past, and future, as sequence in events, within the experience of certain physiological realisations of these ante-cosmic potentialities, come into existence. These points will be fully discussed in later chapters, dealing with the metaphysics of time, space, matter.

From this standpoint, the cosmos is the ordered unfolding of these ante-cosmic potentialities. What biologists call biophors, bioblasts, physiological units, etc., and what physicists call atoms, are cosmically realised analogues of these ante-cosmic potentialities. Stars, planets, satellites, cells, organisms, types, instinct, reason, emotion—everything we can experience, that has been experienced, that is to be experienced, exists as ante-cosmic potentiality, or divine determinism.

Let us apply these propositions to what we conceive as personality. Let us assume that man is descended, in a direct line, from a primal product called a unicellular organism composed of nothing but what biologists call nucleo-plasm and cytoplasm. Unless we assume that evolutionary progression has happened by "chance," we must assume determinism behind this cell and all the intervening products between it and man. We must have either all "chance," or all determinism. If there is God behind the cooling of a sun, there is God behind a moth's cremation in a gas-jet. Incidentally, I may point to the curious fact that, while all science is a direct refutation of the doctrine of "chance," scientific people, almost without exception, fear that

science will collapse so soon as they formally accept determinism in its ultimate logic as foundation for science. Again, while scientific people demonstrate determinism but formally ignore its ultimate logic, theologians decry science because they think it demolishes an overruling Deity.

Biologists now recognise that Darwinian "selection" is inadequate to account for the origin of species, otherwise of typical variation. There must be a factor to decide the existence of variations before the Darwinian processes can operate. "Chance"-variability, as propounded by Darwinians to afford the basis for natural selection, is now seen to be inadequate as assumption; but even assuming its adequacy does not obviate determinism. Weismann has advanced to fill the void between Darwinism and the origin of variation what he calls germinal selection. This, fundamentally, is what I have advanced in this and in other works as biophoric and atonic selection. However, Weismann's doctrine of germinal selection ignores corollaries in the attempt to evade determinism. Germinal selection, as propounded by Weismann, is, essentially, but the Darwinian assumption of "struggle for life" applied to vital elements, instead of to organisms. Consequently, all the difficulties besetting the Darwinian doctrine beset Weismann's doctrine. Germinal, as fully as Darwinian, selection must be accounted for, and either be determined, or the product of chance. Weismann seems to imagine he has escaped determinism by attributing the results of the intracellular struggle (involving the predomi-

nance of certain biophors and the extinction of others, and, as corollary, involving variations in the organic type) to the greater or lesser advantage to the organism resulting from the prevalence of this or that germinal constituent. Victory and defeat in the germinal struggle depend on whether certain biophors are, in Weismann's own words, "advantageous," "necessary," "useful," or the reverse, to the organic development. This new doctrine, besides being no more ultimately explanatory than the older one, involves repudiation of the fundamental Weismannian hypothesis of "continuity of the germ-plasm." If these biophors are to prevail, or succumb, according as they are advantageous or the reverse to the organism, the soma must necessarily condition the germ-plasm, or the biophors must be miraculous agents endowed with foresight regarding what is "advantageous," and with will to exercise that foresight. However, I am now concerned with another point. It will be seen that this new hypothesis lands us in the very difficulty of Darwinism which it ("germinal selection") is advanced to obviate. We are simply dealing with biophors in correlation as determinants, as Darwinism deals with organisms. If Darwinism requires, as complement, "germinal selection," to afford the basal variations for "natural selection," germinal selection is in like quandary, inasmuch as it requires some supplementary hypothesis to account for the existence of the primary variability on which depends germinal selection. So we may go on, *ad infinitum*, inventing hypotheses to

supply the deficiencies of other hypotheses. However far we proceed towards speculative infinity, there still looms before us supernatural determinism.

Weismann seems to tickle himself with the idea that, by playing with a few words, he has escaped this ultimate factor. It is enough for Weismann to assume that all the biophoric material for the germinal struggle exists, to be called into action by the necessities of the organism. This is merely shifting the difficulties a stage further back, just as the kinetic hypothesis of gases shifts back the difficulties of gaseous phenomena. Why should we invoke the supersensuous to elucidate sensuous phenomena, if all we do thereby is to transform sensuous into supersensuous problems? We may as well be satisfied with ordinary Darwinism positing the existence of the sensible material for organic struggle, if all we attain by invoking transcendental Darwinism is the proposition that insensible biophoric material for struggle exists. The crux is: Whence issues the material and whence its potentiality for differentiation? By such refining procedure as is involved in the doctrine of germinal selection, as propounded by Weismann, we simply transfer the idea of organic environment to the organism itself. This becomes the environment deciding the biophoric struggle, just as conventional environment decides the organic struggle.

It may be asked, if all evolutionary phenomena are determined by a Creator, why involve the conception of ante-cosmic potentialities, as the

analogues of cosmic actualities ; why not accept the theological doctrine of direct creation of each individual product? I deal with this question particularly in another chapter. In the meantime I reply : As I try to reconcile my speculation with what, to my apprehension, appear the facts of cosmic evolution, revealed by biology and physics, it seems to me more rational to assume a potential and summational act of creation, than a special act for each individual product. Assuming such a special act for each product would leave uninterpreted the multitudinous effects (environment, interaction, propagation, ordered transformation) constituting the whole range of phenomena, the scrutiny of which affords us intellectual life. We do not merely need an interpretation of particular cosmical appearances, in the shape of individual organisms. We require to interpret inter-relationships involving what I may term cosmical coherence. The mere positing of special acts of creation involving successive individualities was adequate to certain evolutionary stages. Our experiences are now too wide and complex to enable us to tolerate such interpretation.

I can only reconcile what is verified, as evolution, with what I propound, as extra-phenomenal effects, by assuming ante-cosmic potentiality as the forerunner and analogue of cosmic actuality. There is no alternative between this procedure and the repudiation of modern investigation and adoption of theological "miracle." Of course, what we now perceive through investigation involves miracle in-

finitely more impressive than do the propositions of theological dogma. We cannot intellectually resist the demonstration that organisms are perpetuated through certain determining factors which we call cells, and that these cells are themselves conditioned by constituents to which we apply various terms implying the conception of vital units. On my hypothesis, these elements are, essentially, what we conceive as spirit. These vital elements are the cosmical actualities representing ante-cosmic potentialities of what we perceive as physiological life. When these cosmic actualities appear they disappear as ante-cosmic potentialities. Then they start as cosmical evolutionary factors in the realm of relationships, becoming cosmic actualities as they were ante-cosmic potentialities. In this, their terrestrial stage, these vital units condition what we call the hereditary potentiality of organisms, and (contemplating them biologically, as individualities) by multiplying within or without (though I *sensualise* these elements as being *within* the organism, I *intellectualise* them as being possibly *without* the organism. In fact, the terms within and without, in the connection, are, to me, intellectually insignificant) the organism, they cause fresh organisms to issue. This multiplication of vital elements, within or without an organism, is, from my standpoint, not a physical process. It is what I will term a super-mechanical process. It involves the entry on its cosmic stage of an ante-cosmic potentiality. This ante-cosmic potentiality as an emanation from Deity contains within itself,

when actualised as a cosmic potentiality, or biophoric integration (soul), all the conditions not only of its cosmic but also of its post-cosmic stages. It has no "consciousness" of these conditions. Thus, as a human being, it has, as actualised cosmic potentiality, no consciousness beyond its terrestrial stage of existence, nor is it conscious of future terrestrial experiences determined for it. If it "dies" as a terrestrial child, or as a man, the contingency was determined in it, as ante-cosmic as well as cosmic potentiality. It was ante-cosmically determined, as the case may be, to "die" as a terrestrial child, or man, or embryo, or unfertilised germ-cell. This involves that not only its terrestrial hereditary character but also its terrestrial *environment* was ante-cosmically determined. Thus, a human being dying as a child through lack of medical aid might have lived, we will assume, had such aid been applied. Still, that organism's environment being ante-cosmically determined, the lack of medical aid and the organism's "premature" death were so determined. There is no such thing as what we call accident. To posit accident with a Creator is puerile. Hence, we must posit environment as potentially present, as well as what we call hereditary character. This is a necessary rider to the assumption of ante-cosmic determinism for the individual, implying also ante-cosmic determinism for the cosmos, as a collective entity. Terrestrial environment has thus its ante-cosmic analogue as has terrestrial hereditary character. Accordingly, cosmical evolution is ante-cosmically anticipated.

Weismann conceives his germ-plasm as matter. This matter must be something totally different from matter as known to chemistry or physics, inasmuch as no phenomenon comparable with procreation and with the determinism of germ-plasm is within the purview of chemistry or physics. I am now going to define what, from my standpoint, really constitutes procreation, or the multiplication of individual organisms. First let me say what procreation is *not*. It is not the admixture of "matter," in any shape or form. All the ingenuity of biologists in working out an hypothesis of heredity, on the assumption of minute bodies ("determinants," "pangenes," "biological units," "gemmules," etc.) as constituting hereditary potentialities, is, from my standpoint, futile as interpretation of the essentials of heredity. I maintain that procreation is nothing but a special manifestation of the soul's *fiat* (to be dealt with later in detail), and that hereditary determinism is another such manifestation. Whether the method of procreation be the most rudimentary fission of a single-cell organism, or the sexual process of later evolved types, the essence of the phenomenon is the soul's volitional *fiat*, or "dynamical suffusion" (of which I shall treat fully in a later chapter). As this *fiat*, in one of its forms, causes me to move a chair, so does it cause "matter" to assimilate and transmute "matter" so as to involve cellular multiplication, or procreation in all its forms as sensorially recognised by biologists.

The physically perceived manifestations through which biologists hope to discover the cause of pro-

creation and hereditary determinism, are no more the prime efficient than a lever is such an efficient in raising a weight. Weismann's germ-plasm, assuming its physical existence, is, as physical agent, no more the cause of hereditary determinism and organic reproduction, than the brain, as a mere physical agent, is the cause of thought. Sexual reproduction is not the mere coming together of the "nuclei" of two "cells." As mere "nuclei," these factors can no more ensure procreation than could two iron nails. These "nuclei" are merely the vehicles by which the soul causes procreation, just as, by way of analogy, the brain is a vehicle for the soul's causation of thought.

Of course, I do not mean to assert that the nucleus is not the apparent cause of procreation, any more than I mean to assert that the brain is not the apparent cause of thought, or that a molecule of carbon may not be the apparent cause of a particular chemical change. What I mean to assert is that in none of these cases is the apparent the really efficient cause of the particular effect—that empiricism can only reach the threshold of truth now available as to empirically identified manifestations. I say to empiricism: Go ahead as resolutely as you like, in your own way; but do not pretend to reveal ultimate issues. However far your special methods may seem to carry you, they still leave you, essentially, where you started.

The growth of the organism depends upon assimilative and excretory function, and involves two

principal phenomena—cell-multiplication and cell-outgrowth. In the latter process, the cell, instead of dividing, increases in bulk through growth of cytoplasm (non-nuclear material). The most primitive cells, according to biology, have the greatest capacity for multiplication, while those latest evolved and, corollarily, the most specialised have virtually lost the power of division. The varying phenomena of regeneration of lost parts depend on this power of division. Those cells which have lost this power of division have, on the other hand, often acquired a great capacity for individual growth. The nerve-cells of the highest types of organism are highly specialised, and, in man, are supposed not to multiply after the organism has reached the embryonic stage. Thus, any difference in the bulk of nerve-structure, in the case of man, between the infantile and adult stages, is the product of the cell's capacity for individual growth, not for multiplication. Hence, from infancy to old age, the human organism responds to mental stimuli *through the same individual cells*. This point seems to me of great significance in connection with the facts of continuity of consciousness during the life of the organism. If the nerve-cells were, like many other somatic cells, renewed during the life of the organism,—whereas they merely functionally develop as individuals,—it would be difficult to account, psychologically, for that continuity of mental response which, notwithstanding progressive differences from infancy to senility, normally involves a coherent individuality. We

could not, on the hypothesis of change of nerve-cells, readily conceive how the succession of psychical stimuli acting through life could influence us, through memory, so as to issue in a consistent manifestation of mental personality. On the other hand, if the individual nervous elements responding to the psychical stimuli are from infancy to old age the same, there is little difficulty in conceiving that combination of persistence and metamorphosis involved in the mental development of a normally consistent personality.

We are, biologically, driven to infer that, through all evolutionary epochs, specialisation of function among cells has involved all gradations of type, from the simplest primitive to the most complex existing organism, and that the higher nervous effects involved in conscious cerebration have only become possible through the loss, by certain highly specialised cells, of the rudimentary capacity for independent existence. As the civilised man has virtually lost the savage's capacity to lead an independent existence, so have these specialised cells become dependent on their fellows. We must be careful, however, not to stretch this analogy too far. This loss of capacity, by cells, to function independently, is an *internally* predetermined effect. The man's loss of capacity is an externally predetermined effect. The comparison of cellular with human interrelationship is only admissible as rough analogy, not, as some would have us believe, as approximate identity. A civilised man loses his capacity for independence through function-

ing as a unit of a highly specialised organism—society. But this does not involve that the civilised man has *hereditarily* lost the capacity to function independently. Let him betake himself from civilised to savage environment, he would largely regain his capacity for independent existence. Let him have children born and brought up under savage conditions, they would be devoid of their parents' acquired dependence. In other words (excluding the effects of "selection" in modifying the type), they would start life with all the *hereditary* potentiality for independence of their savage ancestors. The case is different with regard to specialised cells. These are *hereditarily* specialised. Their dependence has not arisen through environmental conditions, but through soul-determinism. Their successive phyletic, or typical, modifications have not arisen through external, but through internal conditions. In other words, typical variation involving new personalities has not arisen, according to biology, through the effect of extraneous conditions on existing persons (or the soma), but through ante-cosmic determination of biophoric integrations. The only effect on physiological personalities of extraneous influences is to determine (1) certain combinations involved in sexual reproduction and conditioning what biophoric integrations (germ-cells) shall combine to issue as new organisms, and (2) what particular personalities shall prevail under Darwinian "selection." Of course, the one form of determinism is no less rigid than the other. "Environment"

conditioning "natural selection" is no less pre-determined than are the ante-cosmic affinities involving biophoric integration. Environment is determinism applied to the cosmos; biophoric integration is determinism applied to specific individualities.

CHAPTER III

SEXUAL DETERMINISM

BIOLOGY itself, purely from its own standpoint, confirms my proposition that it is the soul, not the nucleus in the materialistic sense, which conditions procreation. Thus Weismann writes: "If it were possible to introduce the female pronucleus of an egg into another egg of the same species, immediately after the transformation of the nucleus of the latter into the female pronucleus, it is very probable that the two nuclei would conjugate just as if a fertilising sperm-nucleus had penetrated. If this were so, *the direct proof that egg-nucleus and sperm-nucleus are identical would be furnished*" (italics mine), (*Essays upon Heredity*, Clarendon Press, 1892, vol. ii. p. 91). Now, if the egg-nucleus (female) and the sperm-nucleus (male) are identical, it is obvious that sexual difference cannot depend on difference between "nuclei," as "matter." Obviously, there must be something operating, able to endow the same "matter" with different potentialities, otherwise sexual difference could not exist. This "something"

is the soul's volitional *fiat*. The soul wills sex, as it wills my moving a chair, or as it wills the thinking of this paragraph. This point will be rendered clearer in the chapter dealing with Soul.

Though the experiment suggested by Weismann is impracticable, other experiments and ascertained facts confirm his view as to the identity of male with female "nuclei." Thus he tells us : "Such want of experimental proof is partially compensated for by the fact, ascertained by Berthold, that in certain Algæ (*Ectocarpus* and *Scytosiphon*) there is not only a female, but also a male parthenogenesis ; for he shows that in these species the male germ-cells may sometimes develop into plants, which however are very weakly." Again : "Boveri has been more fortunate ; for he succeeded in finding an object which permitted the converse of my experiment. Adopting the method of R. Hertwig, he separated, by shaking, the nucleus from the ovum of an *Echinus*, and succeeded in rearing such denucleated eggs by the introduction of spermatozoa. A regular segmentation nucleus was formed from the spermatozoon which penetrated the egg, embryogeny followed its usual course, and the egg gave rise to a perfect but rather small larva, which swam freely about in the water, and lived until the seventh day. This experiment is by itself sufficient to prove that the views on fertilisation adopted by Strasburger and myself are correct, viz. that the nucleus of the spermatozoon (male) can play the part of the nucleus of the egg (female) and *vice versa*" (*op. cit.* pp. 91-92).

Again, Oscar Hertwig writes: "Males and females, whether they be more or less unlike, arise from the same germinal material. The germinal material itself is sexless—that is to say, there is not a male and a female germinal material. The phenomena of inheritance in the sexual generation of hybrids show this clearly. Characters appropriate both to males and to females are transmitted either by eggs or by spermatozoa. In parthenogenetic animals both male and female individuals appear at definite times from eggs produced without sexual commerce. Whether the male or the female forms be produced depends, not upon any difference in the germinal material, but on the external influences, just as external influences determine whether the bud on a twig shall give rise to a vegetative or to a flowering shoot, to a thorn or to a stem. The influence of food, of temperature, or probably of other agencies, determines in which direction the germinal material shall grow" (*The Biological Problem of To-Day*, Heinemann, London, 1896, p. 123). Here we are confronted with the familiar distinction between potentiality and manifestation. Just as a man may have the potentiality for hating, and still lack the stimulus to manifest his potentiality, so has the soul endowed germ-plasm with potentiality for either sex, and left environment to decide which sex shall be consummated. Thus, the matter by which soul manifests itself, as germ-plasm, may be compared with the matter by which soul manifests itself, as brain. As the brain, reacting to environment, excites

this or that intellectual, emotional, or sensory *fiat* in the soul, so does the asexual germ-plasm, similarly reacting to environment, excite in the soul this or that sexual *fiat*. Or, we may put it this way : As the brain's reaction to environment causes it through soul-*fiat* to think, or feel ideas, so we may say does the germ-plasm's reaction to environment cause it, through soul-*fiat*, to "think," or feel sex. In either case, the essence of the thinking, whether it involves, as issue, ideas or sex, is the soul's *fiat*, not the germ-plasm, or the brain. As the germ-plasm, *per se*, is sexually inert, so is the brain, *per se*, ideationally inert. I shall revert to this subject in a future chapter dealing specifically with soul in connection with biology.

The ensuing sex, in relation to germ-plasm, is somewhat analogous to, say, hating, or not hating, in relation to the man. The analogy is not complete, for, while the human adult *can* hate, though he does not hate, the "adult" germ-plasm, as an organism, cannot change its sex. While the man's capacity for hating remains with him during life, the germ-plasm's capacity for producing either sex only remains with it during its "embryonic" stage as constituent of an egg. Still, these subsidiary differences do not affect the principle that the asexual soul responds, through its material envelope (germ-plasm), to environment, in respect to the sexual issue, as, again, this non-thinking soul responds, through its material envelope (the brain), to environment, in respect to thought-issue.

From the materialistic standpoint, matter has only one potentiality—inertness, and this it always manifests. From this standpoint, matter can *do* nothing, and if it cannot do anything, it cannot integrate itself, or, without the impulse of some spontaneous agent, become integrated into what we understand as a system. No matter, such as is posited by materialistic hypothesis, can be integrated into what we understand as an organism, by what the Materialist posits as environment. The nucleus identified by biologists is an organism. Assuming the nucleus to be nothing but the matter of materialism, it is self-contradiction to deny its determinism by a power outside matter, to say nothing of asserting that a sexually indifferent nucleus can originate sexual differentiation. The sexually indifferent, sex-differentiating nucleus imagined by materialistic biologists is no more rationally tolerable than is a self-evolved sewing-machine.

The matter imagined by Materialists must always manifest all its potentialities. Whatever does not manifest all its potentialities cannot be the Materialist's matter. If the sexless nucleus has the potentiality to manifest sex, that nucleus is, essentially, not "matter," but "soul." It is either absolutely free, or is conditioned by what is absolutely free. To deny this is equivalent to asserting that what is not is, inasmuch as a potentiality that is not manifested is non-existent, and what is non-existent can only change to existence through creation, which, again, is only possible to an agent outside conditions—

otherwise absolutely free. If the sexless nucleus has the potentiality for sex, it must either be outside conditions, as a spontaneous agent, or must be conditioned by such an agent. The Materialist implies that what he calls environment takes the place of the spontaneous agency. Thus the Materialist constitutes himself an unconscious metaphysician. If he likes to imagine his "environment," he is welcome to it so far as I am concerned, though I think I shall be able to dissipate it into insignificance.

Weismann writes: "I believe that the essential, fundamental, and original peculiarity of living matter was the power to assimilate and to grow without limit. On this depends the existence of the whole organic world ; it is a primary power, not a secondary one, and cannot have been conjured up afterwards in the organism by any refined artifice, call it conjugation, fertilisation, or anything else. It must have been present from the very beginning of life on the earth. How otherwise could life have persisted up to the first appearance of conjugation or fertilisation? For there can be scarcely any doubt that neither of these processes is found in the lowest organisms at present known to us. I therefore think that the loss of this fundamental power of unlimited growth must be regarded as a secondary adaptation, called forth by certain special circumstances which rendered it necessary for achieving the combination of different individual hereditary tendencies" (*op. cit.* p. 90). Still, Weismann

jibes at the supernatural and twits "certain writers" with "upholding a long-vanquished and mystical principle." Surely some "mystical principle" is invoked by Weismann himself in the above propositions! Why should "living matter," any more than "dead" matter, accomplish "a secondary," tertiary, or any other sequential "adaptation" in order to achieve "the combination of different individual hereditary tendencies"? If this "living matter" came on the earth, endowed with the power—how it became endowed, Weismann does not say—"to assimilate and to grow without limit," it passes my imagination how we are to account for its curbing the unlimited capacity, unless we invoke a "mystical principle." But Weismann will have nothing to do with mystical principles so long as the universal panacea, "adaptation," comes pat to meet the contingency. I have often tried to imagine how the eminent investigator has escaped recognising himself as a concentrated supernaturalist! Indeed, I think he is beginning to suspect where he really is, speculatively. Thus, he writes, in later publications than that from which I have above quoted: "But . . . there is nothing to prevent our conceiving (if conception be the right term to use in such a context) of a Creator as lying behind or within the forces of Nature and being their ultimate cause" (*Contemporary Review*, September 1895, p. 456). Again, "Germinal selection is the last consequence of the application of the principle of Malthus to living nature. It is true it leads us into a terrain which cannot be submitted directly

to observation by means of our organs of touch and by our eyes, but it shares this disadvantage in common with all other ultimate inferences in natural science, even in the domain of inorganic nature—in the end all of them lead us into hypothetical regions. If we are not disposed to follow here, nothing remains but to abandon utterly the hope of explaining the adaptive character of life. . . . The variety of the organised world, its transformation by adaptation to new, and by reversed adaptation to old conditions, the inequality of the systematic groups, the attainment of the same ends by different means, that is, by different organisations, and a thousand and one other things assume on this hypothesis in a certain measure an intelligible form, whilst without it they remain lifeless facts” (*Germinal Selection*, Open Court Publishing Company, 1896, pp. 43-44). Just such “lifeless facts” are Weismann’s demonstrations of adaptation, unless we allow them to lead us into the “hypothetical regions” which I am exploring in this work.

All that Weismann achieves, by his demonstration of germinal selection (Darwinism applied to hereditary elements), is what the physicist achieves by his demonstration of atoms. Both demonstrations leave the essential crux *in statu quo* and impose on the investigator, whether biologist or physicist, the logical necessity of carrying further, as metaphysics, the inferential processes by which he attains his ultimate biological or physical truths. The further physicists and biologists proceed, on

their special lines, the more completely they discredit their specialism, as a means of investigating ultimate issues. A curious result this—that the main office of the most advanced “science” is to demolish its own pretensions!

Sexual coition is, essentially, a spiritual, not physical, phenomenon. The blending of hereditary characters of the parents, in the offspring, depends on the soul's *fiat* of each parent; it is not a matter of the mere physical co-operation of two “nuclei,” any more than thought is a matter of mere “molecular” movement. As mere “matter,” the nucleus has no more capacity for procreation than nervous “molecules” have capacity for thought. If nuclei, as mere physical agents, were endowed with the capacity for procreation, why should the “waste” incident on non-procreating nuclei be possible any more than is, say, the “waste” of its inherent potentialities by a non-organic physical molecule? This biological “waste,” on the conditions, occurs at each normal, to say nothing of abnormal, expulsion of germs. Why, of the multitude of ova and sperms coming together, at each sexual act, should only one of each, normally, prove procreatively efficient? Each ovum and sperm, on the biological assumption, is equally endowed with the capacity to co-operate for procreation with its sexual “affinity.” Why then should the procreating organism only consummate an infinitesimal part of the potentialities, on the assumption, released at each sexual act? What says to one

germ and one sperm nucleus, out of scores, hundreds, or thousands, as the case may be: You two nuclei, and only you two, shall procreate? Adaptation, answers the biologist—the organism is only adapted to produce a fixed number of offspring at a birth.

This answer only enables us to dodge the real difficulty. How can a nucleus “adapt” out of existence, on the hypothesis, its inherent potentiality? If both germ and sperm nuclei are endowed with potentialities enabling them to co-operate for procreation, when they come together, why should only one or two thus co-operate, at each sexual act, when scores have, physically, the same opportunity for co-operating? My answer is: Because the *fiats* of the two parental souls compelled the particular co-operation which did occur; because, whereas nothing but what I shall later elucidate as the “vital constant” conditioned those spermatozoa and ova which did not co-operate, the soul’s “dynamic suffusion” conditioned those spermatozoa and ova which did co-operate. In the one case, the originating souls’ *fiats* involved the co-operation of the nuclei and the procreation of a fresh soul; in the other case, the paternal and maternal souls merely caused the suffusion resulting in the “vital constant” of the particular spermatozoa and ova which failed to co-operate for reproduction.

“After the discharge of the seminal fluid, the spermatozoa exhibit spontaneous movements for many hours or days. . . . The spermatozoa of the

frog may be frozen four times in succession without killing them. They bear a heat of 43.75° C., and they will live for seventy days when placed in the abdominal cavity of another frog" (Landois and Stirling, *A Text-Book of Human Physiology*. Griffin, London, p. 847). The above indicated is the only life with which spermatozoa, as physical agents, are endowed. It is the same life, involving only the "vital constant," which ensures transient reflex activities in the members of a "dead" organism, that is—an organism divorced from its soul. Such mere vegetal life is quite distinct from procreative energy involving new soul-creation, or the origination of offspring. This proceeds from what I shall later examine as "dynamic suffusion" constituting soul-fiat.

So long as a germ or sperm is "dynamically suffused" with the procreative faculty, it will energise efficiently for procreation; in other words, it is decreed to procreate. In the case of certain primitive organisms it is, as already shown (see experiments previously referred to, by Boveri and others), possible to ensure procreation by artificial means and under abnormal circumstances. However, I maintain that it is only possible to ensure such abnormal procreation in the case of nuclei which have been "dynamically suffused" for procreation. In the case of nuclei which have not been so suffused, and which are merely conditioned by the "vital constant," I maintain that no procreation can ever occur. Apart from the procreative soul-fiat, germs

and sperms have no more procreative efficiency than have ordinary tissue cells, or than has "dead" matter.

That the organism, as such alone, is not exclusively "adapted" (in the biological sense) for the number of offspring normally ensuing from a sexual act is shown by the not infrequent departure from the normal number (for instance, twins, triplets, in the case of human procreation). The organism, as such alone, is obviously adapted to give birth to more than the normal number of offspring born of a sexual act. The true interpretation, from my standpoint, of the normal fixity of number at a birth, is that the soul's *fiat* involves such number, by only "dynamically suffusing" the special nuclei which procreatively co-operate. Procreation is a matter of *volition* (as to be metaphysically demonstrated, not in the conventional sense), not of physical admixture.

It may be urged that the above is not a "scientific" interpretation—that it imports a determining factor outside the possibility of human identification. I reply that the factor I import is no more outside human identification than is the supposititious determining factor called a nucleus, or a brain. Because certain faculties enable us to identify the brain and nucleus, while other faculties enable us to identify the soul, does not involve that the soul is less a matter of identification than is the brain, or nucleus. Nothing but habit causes us to make the conventional discrimination. I show, in this work, that the brain and nucleus cannot be

rationally posited as determining factors at all. I show that we can no more rationally attribute determinism to nuclei and brains than we can attribute such determinism to hammers. I show that the soul, as a determining agent, is just as logically inevitable, as inference, as is the arm that wields the hammer when it clinches a nail. Moreover, I show that the soul, without God, is no more possible as a determining agent than is the hammer, without the arm that wields it.

It may be urged that it is inconceivable that the soul should select one out of thousands of nuclei for the purpose of procreation. I reply, first, that I am not concerned about the conceivability or inconceivability of the event. What I am concerned about is: Is the event an inferential inevitability? Secondly, I reply, the event in question is no more inconceivable than that the soul (or, if you like, say brain) out of thousands of possible thoughts and volitions should select one as the thought or volition that occurs to us. The question of *number* of alternatives is a mere phantom of our subjectivity. There is *no* alternative. Everything that happens is what alone *can* happen.

In the biological connection, the reader must divest himself of the notion that the nucleus is anything more, in respect to procreation, than a vehicle for the soul's *fiat*. Whether the soul "dynamically suffuses" for procreation one out of a million spermatozoa or one out of two is beside the point at issue. This point involves inference from the

whole body of human experience, not from the mere microscopical investigations of cellular morphologists. These can tell us nothing about *causes*; they can only record apparent effects of causes. So far as causes are concerned, Weismann's hypothesis of germinal selection is practically as far away from them as are the crudest notions of a child. To approach causes we must apply our intellects to the whole body of scientific experience, of which biology is only an item. The ultimate refinements of physicists and biologists, to the cause-seeker, are only significant as sign-posts on the road. When the cause-seeker has passed all these sign-posts he must explore on his own account.

From my standpoint, current biological hypotheses, professedly accounting for the cause of sexual difference and interpreting its significance, labour under the defects common to all specialistic ultimate conclusions, which really merely re-state the problem. To illustrate this point we will glance at the principal current hypotheses regarding sexual differentiation.

One school tells us that sexual differentiation into male and female has arisen and continues through physiological necessity involving sequential effects—anabolism and katabolism, or respectively, constructive and disruptive metamorphoses persisting—to our apprehension—throughout protoplasmic activities, as what we call growth, decay, recuperation, fatigue, birth, death. Thus, according to this hypothesis, sex—whether it be that of two primitive single-cell organisms, or of the most complex multi-

cellular type—depends, fundamentally, on nutritive conditions. The male sex is supposed to be the product of katabolic or disruptive conditions; the female sex, of anabolic or constructive conditions.

I may here observe that there is satisfactory evidence that the sexual issue does coincide, as postulated above, with nutritive conditions. But this is not at all equivalent to granting that the one issue is the cause of the other. The advocates of the hypothesis with which I am now dealing seem to jump to the conclusion that, as a male organism (supposedly) ensues under katabolic, and a female under anabolic, conditions, therefore the nutritive conditions are the cause of the sexual conditions. We might as plausibly contend for the converse—that the sexual conditions are the cause of the nutritive conditions; that as, say, katabolic conditions are adapted to a male issue of procreation, then, if a male issue is procreatively determined, the germ-plasm adapts its nutritive conditions to the sexual necessities. If it be urged that artificially created katabolism ensures the particular sexual issue, and that, therefore, the katabolism causes that issue, instead of the sexual necessities causing the katabolism, I reply that—as the potentialities for either sex are in the fertilised ovum—even this artificially created katabolic environment would merely be an excitant, not a cause, of the sex-issue. This cause must still be sought deeper than in the nutritive conditions. Of course, we may loosely affirm causation in the particular case, just as we may say that a slap on

the face causes us to wince, while we nevertheless know well enough that the slap is not a cause at all, but merely an excitant to a cause which lies in the sentient nervous factors. Really, the slap is no more the cause of the wincing than the wincing is the cause of the slap. In the case of the sexual issue, as in that of the wincing, when we deal with the excitants as causes, we are bemuddling ourselves with the familiar *post hoc ergo propter hoc* fallacy. To get at cause, in relation to sex, we must dig far below the ring-fences of materialistic science. Far from mere nutritive excitation being such a cause, matter itself, as the conventional germ-plasm, is not the cause. The cause, I repeat, is the soul's *fiat*, called forth by germ-plasm in response to the particular nutritive contingencies (on the assumption of sexual issue according to nutrition) analogously to the case of volitions arising through soul-*fiats* called forth by cerebral matter in response to particular excitants affecting the individual.

Reminding the reader that Weismann attributes hereditary determinism to matter, while I attribute it, primarily, to soul-*fiats*, and only secondarily to the matter which, as hereditary element (germ-plasm), excites those *fiats* (as does, analogously, the brain, in respect to mental manifestations), I may now quote Weismann himself to show the inherent fallacy underlying the physiological hypothesis attributing sex-determinism to a mere environmental condition such as nutriment. Weismann writes: "It does, however, appear to me unthinkable that from the

same *uniform* germ-substance, as assumed by Spencer to exist, such markedly different beings as male and female, queen, worker, and soldier should arise. What would be said were it to be maintained that the germs of all animals are completely identical, and that it is only the difference of external influences which causes the one germ to form an elephant, another a mouse, a third a lizard, and a fourth a frog? There is not a very great difference between such an assumption and that made by Spencer in supposing that the differences of the four or five kinds of individuals which compose the colonies of ants and termites depend only on differences in the nutrition of the larvæ, while the germs themselves are identical. We know that the most minute structures of the living germ-substance are invisible to us, and that we cannot recognise them with the highest powers of our microscopes; we cannot observe the essential differences between the germ-substance of a mouse and that of an elephant. We, however — Spencer included — assume the existence of such differences as the causes of differences in the fully developed animals. What compels us, then, to object to a similar assumption when the explanation of such great differences as are found amongst the castes of ants and termites is concerned? Why, in this case, should the cause be sought in external influences?" (*Contemporary Review*, September 1895, p. 434).

What here applies to ants and termites applies to the whole question of sex-determinism. Nutrient

only affects sex to the extent of calling into activity one or another sex-*fiat*, or in biological terminology, one or another set of "determinants" constituting the particular germ-plasm. Nutriment is thus merely an excitant, not a cause. It does not *alter the hereditary character* of the soul (germ-nuclei) as it would need to do were it a *cause* of sexual variability. It merely excites an hereditarily fixed soul (germ-nuclei) to manifest this or that potentiality. Thus, when I say the soul (germ-plasm) of a complex type of organism is asexual, I mean that it has potentiality for either sex, and that (assuming the nutrimental hypothesis) it will actively manifest one or another sexual potentiality in response to one or another nutrimental stimulus.

Hereditary elements multiply without consuming "food." This I assert on the strength of the biological demonstration of hereditary determinism and the impotency of environment to alter the germ-plasm, and on the strength of inference from sciences other than biology. This inference regarding the non-nutrition of hereditary elements is an inevitable corollary of Weismannism. Thus, Eimer (an opponent of Weismann), in commenting on Weismann's theory of germ-plasm, writes: "On this view" (Weismann's) "we have . . . to consider more fully what we have previously touched upon, an unchangeable, never wearing out, eternally living organic substance . . . *which cannot even be nourished like other parts of the body, for if it were it would necessarily be affected by the constitution of the body*"

(italics mine), (*Organic Evolution*, Eimer. English translation, Macmillan, 1890, p. 41). Obviously nothing we apprehend as matter can be assumed to satisfy the prime conditions of biological theory as to growth and multiplication. If we here admit the factor of food, we admit a fundamental contradiction to the demonstration of hereditary determinism which is the prime premise of all current biology. Obviously, again, biological theory implies such an attribute as that we call will, as inherent in hereditary elements. Thus, again to quote Eimer: "The actions of the ciliated Infusoria in relation to the outer world are such that will must certainly be ascribed to them. This is proved by the simple observation of the character of their movements apart from all else. Their movements are entirely spontaneous, and the variety of these is due to their power of moving all or different sets of cilia more slowly or more quickly or keeping them at rest. . . . Yet in these Infusoria, endowed with mental faculties, we can discover no nerves and no brain. It seems to me probable, from comparison with the relations of the cells of multicellular animals, that their nuclei, while at the same time connected with reproduction, or one of them, also acts as the central organ of the nervous system. . . . If, as I shall endeavour to show, nuclei actually form central nervous organs in multicellular animals, it is evidently highly probable that they do so also in the unicellular" (Eimer, *op. cit.* pp. 318-320). I hardly need impress on the reader how completely Weismann's doctrine of hereditary

determinism involves the assumption of will as an inherent endowment of germ-plasm, and that this will is a truly spontaneous factor (of course under God), not merely the mechanical responsiveness involving simple reaction to stimuli which we perceive throughout the realm of the inorganic.

It will be seen that my hereditary elements are not the biologist's. His are material units; mine are the potentialities of a spiritual entity—soul. The biologist's units, if they exist, are products of this soul. They multiply by consuming food, but they so multiply, not in obedience to the food, but in obedience to the *fiats* which the soul's determinism of their constitution enables these biological units to excite in the soul. Food can affect these biological units, not by altering their inherent characters, but merely by exciting their soul-limited responses. Then the responses of these biological units to food-stimulus excite corresponding *fiats* in the soul. As matter these biological units are physiologically inert. The soul's "suffusion" is what constitutes them physiologically and hereditarily active agents. *They* do not multiply any more than stones multiply. The soul multiplies *them*. What multiplies, of its own initiative (subject to God), is the soul. Biologists call this self-multiplication of the soul, the multiplication of germinal cells. The multiplication of germinal cells is no more significant, *per se*, than is the multiplication of non-germinal (somatic) cells. The only essential difference between a multiplication of germinal and of somatic cells occurs

when particular germinal cells are dynamically suffused by a soul-*fiat* for procreation. When that occurs the further development of those procreatively suffused cells involves also a self-multiplication of soul and, corollarily, the appearance of another organic individuality. Let us now turn to another hypothesis regarding sexual difference. This accounts for sexual differentiation as constituting a rejuvenescence or renewal of typical life which, failing sexuality, would become extinct. As certain organic types which fail to copulate at specific times decay, it is assumed by these theorists that bisexual reproduction came into the world because, failing the process, organic life would fail to perpetuate itself. The hypothesis is complementary to the physiological hypothesis already noticed, and has been knocked to pieces by Weismann. I merely instance it as another case of confounding effects and causes of the sort above considered. We might as well say that life came into existence in order to ensure sexual reproduction, as say that sexual reproduction came into existence in order to ensure life. To talk of life as needing "rejuvenescence" is; from my standpoint, as fatuous as to talk of an infant as needing babyhood, or of babyhood as causing an infant. Life is life. What needs "rejuvenescence" may be a product of life—say an old beau—but not life. Life can no more die than death can live. The concrete manifestations of life may, to our apprehension, change when life leaves them, but that has nothing to do with life.

What is called parthenogenesis, or reproduction

from eggs not directly fertilised by sperms, is the main fact relied on to illustrate the above-mentioned hypothesis of rejuvenescence. It is found that this non-sexual reproduction continues for many generations in various organic types, but, that if sexual reproduction does not occur at a specific time in the life-history of the type, the type decays and ultimately dies out. From my standpoint, this phenomenon is an issue of type-memory or instinct, involving what I may term a deferred soul-*fiat* for sexual reproduction quite analogous to the cases of post-hypnotic suggestion and normal deferred mnemonic *fiats* (which I shall later consider). Thus, referring to a case instanced by Moll (see Note F) of hypnotically induced bowel-opening, just as this occurs independently of the conscious personality of the hypnotised subject, at the time determined by the operator, so does the sexual process, in the case of parthenogenetic types, occur independently, as we may say, of the type-personality, at the time determined by the original typical soul-*fiat* for the occurrence of the sexual process. Here time is annihilated, just as in any of the hypnotic, ordinary, instinctive, and other cases involving memory, which I shall later examine. The parthenogenetic type, like the hypnotised individual, does not "remember" a command or soul-*fiat*, but "remembers," as Moll remarks in regard to hypnotic phenomena, "the idea of execution." In the case under consideration the "idea of execution" involves sexual reproduction "after" an interregnum of non-sexual reproduction.

Just as the deferred soul-*fiat* compels the individual organism to obey, say, the hibernating instinct, so does this deferred *fiat* compel the type to obey the sexual "instinct." In the cases of some types there is no such sexual "instinct." Then there is genuine asexuality, the organisms permanently adopting other methods of preserving the continuity of typical life, as by fission, or simple division into two of the organism itself. This constitutes the normal method of individual cellular multiplication.

A third hypothesis, much emphasised by Weismann and not much opposed by modern biologists, is that sexual reproduction came into existence in order to ensure variability through the intermingling of hereditary predispositions. This hypothesis is, of course, based on the assumption of material particles (biophors, etc.), as constituting hereditary predispositions. It is a biologically acceptable hypothesis, but, from my standpoint of soul-determinism, has not much significance. For me, the hereditary elements of biologists are but symbolic pawns enabling us to make imaginary moves on the evolutionary chessboard, and having as little real significance as causes of hereditary differences, as has the brain, in respect to volition. Like their product, the brain, these hereditary elements are but manifestations of the soul's determinism.

The coming together, for reproduction, of two nuclei is, from my standpoint, the coming together of two soul-*fiats* for the manifestation of another soul. The phenomena dealt with by biology are merely effects of this soul-causation. Sexual coition

with its concomitants (emission of semen, emotional excitement), apart from soul-fiat for procreation, have no significance in regard to procreative issue, but are merely physiological processes affecting particular glands and nervous areas.

In connection with the physiological hypothesis of sex-determinism above discussed, I may refer to a curious statement in the press. The *Daily Chronicle* of 13th January 1898 reports an interview, by a representative of the *New York World*, with Dr. Schenk of Vienna, who professes to have discovered a method of ensuring the birth of male children. Dr. Schenk is a scientific man of repute, and his treatment and theory are, or have been, under consideration by the Imperial Academy of Sciences of Vienna. So far as it is revealed to the public, his case is thus stated, according to the published report by Dr. Schenk himself. "My discovery is based upon the fact that the blood of a grown-up man contains five million blood corpuscles" (obviously, 5,000,000 *per cubic millimetre*), "the bearers of life-giving and nourishing oxygen, whilst the blood of a grown-up woman only contains four millions" (per cubic millimetre). "This difference is the basis of the differences of sex, of the different moral and physical working powers in man and woman. . . . All my efforts are directed towards producing the right number of blood corpuscles required by the male in embryo. I have succeeded in attaining this effect by suitable nourishment of the woman." It will be seen that there is consistency between Dr. Schenk's method

and the physiological hypothesis above discussed, only Dr. Schenk's proposition that a million more corpuscles, per cubic millimetre, are necessary to produce a male, than a female, embryo would seem to contradict the before-mentioned physiological hypothesis that male-sexuality is dependent on katabolism, which would presumably involve, on the hypothesis, a less number originating corpuscles. Thus, to quote from two advocates of the physiological hypothesis: "Let us express this, however, in more precise language. Such conditions as deficient or abnormal food, high temperature, deficient light, moisture, and the like, are obviously such as would tend to induce a preponderance of waste over repair—a *katabolic* habit of body,—and these conditions tend to result in the production of *males*. Similarly, the opposed set of factors, such as abundant and rich nutrition, abundant light and moisture, favour constructive processes, *i.e.* make for an *anabolic* habit, and these conditions result in the production of *females*" (*The Evolution of Sex*, Geddes and Thomson. Walter Scott, London, p. 50).

In reply to a remark of the interviewer that no doubt Dr. Schenk "would be appealed to by many families, especially where large fortunes or property are at stake," the doctor said: "I am no man of business, but am exclusively a scientist. I am not anxious to gain a fortune, but above all that my discovery be scientifically confirmed and recognised. The Academy of Sciences alone can do this. I have accepted no reward in the successful cases I have treated; they are precious to me beyond gold as

proofs of the reality of my discovery. I have achieved such success in a family in which all the most intense desires were directed towards the birth of a son. If I told you the name of the man in question you would know that for him to pay me 20,000 florins for my service is the same as when you pay the doctor five florins for examining your throat, but I did not accept any reward."

Commenting on the above statement of Dr. Schenk, the *Chronicle* observes: "There is only one public personage in Austria to whom all these indications point. He is a member of the Imperial house—Archduke Frederick, nephew of old Archduke Albrecht, at whose death three years ago he inherited the colossal entailed property because Archduke Albrecht left only one daughter and no son. The property consists of extensive land, forests, mines, of iron-works and factories, well known to be worth more than 100,000,000 florins. Archduke Frederick during Albrecht's lifetime lived upon his allowance. In 1878 he married a portionless Princess, who had since given birth to eight daughters, one of whom died. At every birth a son was anxiously expected. Every medical authority was consulted, and all remedies were applied; the Princess was treated with every care, but all in vain. Every fresh birth brought another girl. In 1895 Archduke Frederick became the possessor of an enormous fortune, for which he had no heir. The Princess was resigned to her fate. The Prince could not hope to leave the property to a son. Imagine his joy when, in July

1897, after nineteen years of married life, the Archduchess, in her forty-first year, gave birth to a boy and heir! It is undoubted, from the nature of Professor Schenk's words, that he was consulted by Archduke Frederick, and undertook the treatment of the Archduchess, which he supervised with complete success. In the aristocracy of Austro-Hungary (adds the correspondent) the belief in Professor Schenk has on this account spread with marvellous rapidity, and every day the little street in which he lives is crowded with elegant carriages from which ladies alight anxious to consult the professor."

Now, I will propound my own hypothesis regarding the above-indicated events, assuming all to have happened as reported. First, I do not believe that the blood-corpuscle hypothesis of the doctor is at the bottom of his successes. I believe that the only real efficiency of the doctor's hypothesis lies in the fact that it has so completely dominated him with a conviction of its truth that he is enabled to impose soul-fiats for male births on those impressionable ladies whom he has successfully treated. His dietetic scheme, I should say, is merely a superfluous, or at any rate trivial accessory, analogous to the magnets, etc., which were once supposed to be the essential factors in mesmerism, but are now seen to be quite subsidiary to hypnotic suggestion arising from *fiats* imposed by one soul on another. We have practical evidence of the sufficiency of hypnotic suggestion to produce physiological, anatomical, and psychical changes. I maintain that Dr. Schenk's cases, assum-

ing the events recorded to have occurred, are on all fours with the hypnotically induced changes.

The soul is susceptible to cerebral excitations for *fiats* involving the various psychical phenomena (volition, memory, etc.). Again, the soul is susceptible to cerebral excitations for *fiats* involving various physiological functions. The bowel-emptying case, already referred to, and which I shall later notice more particularly, is an illustration. Many other illustrations of the sort might be given. Thus kidney-secretion, bodily temperature, secretion of saliva, perspiration, emission of semen, lachrymation, respiration, pulse-movements, hunger, thirst, and so on may be excited, repressed, controlled, perturbed, as the case may be, by hypnotic suggestion. Further, the soul is susceptible to cerebral excitations for *fiats* involving even anatomical changes. Thus blisters, burns, hemorrhages, "stigmata" have been induced by hypnotic suggestion. The soul can will anything. What it *does* will is determined by the efficiency of the nervous system to excite and respond to soul-*fiats*.

Now, the soul being sexually indifferent, I maintain that, just as hypnotic suggestion may evoke *fiats* involving perturbation of common physiological functions and anatomical changes, so may hypnotic suggestion involve the birth of one or another sex, by evoking a *fiat* from the asexual soul, for a particular sexual issue. In such a case, the brain does, essentially, no more than it does at every exercise of conventional volition. Dr. Schenk's successfully treated clients were hypnotised by the

doctor. Could they have hypnotised themselves, so as to induce suitable soul-*fiats*, they would have ensured the same success as that achieved by the doctor. However, such self-hypnotism, involving what is called auto-suggestion, must arise from the brain's excitation of the soul ; whereas when hypnosis arises, *ab extra*, there is direct influence by one soul on another. In the case of the doctor's clients, what their own brains could not evoke, as *fiats* from their souls, was evoked by the dominating influence of the doctor's soul on theirs. He first hypnotised himself into an intense confidence in the truth of his theories about blood-corpuscles, etc. This intense confidence, as cerebral excitation, evoked an exceptionally strong soul-*fiat* to produce a certain procreative effect. His soul-*fiat*, again, found congenial soil in the souls of his clients, in which their respective brains had long been ineffectively "trying" —if I may so use the term—to evoke corresponding *fiats*. Thus, the doctor was readily in *rapport* with his subjects.

In ordinary cases in which nutriment does affect the sexuality of offspring, the effects are produced by nuclear reactions to the particular nutrition. Then the germ-plasm arouses particular sexual *fiats* in the soul. In the case under consideration, however, I believe that the interpretation is supplied by hypnotic phenomena.

In sexual organisms, the germ-plasm of biologists is, as already indicated, asexual, with the potentiality of producing sexuality at its later developments. It

may be said, by way of analogy, to "cause" the morphological and physiological characters of sex, as the non-thinking brain "causes" thought and feeling. In performing their respective offices, both these factors respond to environment. This response to environment involves the excitation of soul-*fiats*. However, the respective possibilities of response to environment of the brain and germ-plasm are strictly limited by their inherent or hereditary characters, which, again, are dependent on the "hereditary" character of the particular soul from which, respectively, the germ-plasm (primarily) and the brain (secondarily, as a product of the germ-plasm) originate. So, while the brain, as thinker, involves what we call immaterial products (thought, feeling, etc.), the germ-plasm as, we will say, "thinker," or producer, involves what we call material products (organs, tissues, etc.). The essential difference between these products of the brain and germ-plasm does not consist in the respective "materiality" and "immateriality" of those products, but in our personality which fabricates different percepts of the products. Whether we deal with a "germ-plasm" which "thinks" one or another "sex," or with a "brain" which "thinks" "immateriality" as distinct from "materiality," we are ultimately dealing with one fundamental identity—soul-*fiat*. The difference, as materiality and immateriality, between the respective products of the germ-plasmic and cerebral "thinkers," or producers, is essentially the difference between soul-*fiats*.

From this standpoint, we see that when biologists deal with what they call germ-plasm, as an ultimate determining factor, they are really dealing with a factor which is, essentially, no more ultimate than is its derivative—the brain. Again, though so far as we can profitably employ reason to concrete scientific problems, such as arise in biology and psychology, the soul is the ultimate factor in “evolution,” still we must not overlook the transcendental demonstration that the individual soul is a product of differentiation of one ante-cosmic soul emanating from God.

As the individual soul conditions its germ-plasm ; as this germ-plasm, again, conditions the morphological, physiological, and psychological character of its issuing “body,” so does God condition the differentiation of the ante-cosmic soul into individual souls. From my standpoint, this supreme determinism by God involves what we call “successive” differentiation of the ante-cosmic soul into (1) type-souls (involving distinct “species”) ; (2) of these type-souls into individual souls. Thus we may say that the type-soul bears the same relation to individual souls as the ante-cosmic soul bears to individual type-souls, or as God bears to the ante-cosmic soul. Heredity is thus, from my standpoint, not a question of “germ-plasms” but of souls. The “continuity of the germ-plasm” is the continuity of typical soul-*fiats*.

The question of sexual differentiation thus resolves itself into a question of the excitation of a particular soul-*fiat* by “germ-plasm,” free, within its “hereditary” limitations, as is its after-product, the brain,

to respond to external conditions. Contemplating, from my standpoint, Dr. Schenk's reported method of controlling sexuality by "producing in the embryo the right number of blood-corpuscles, by suitable nourishment," I am inclined to exclaim "moonshine," and laugh at the doctor! Or, on the other hand, I am inclined to respect his scientific prestige and doubt whether he has intentionally promulgated such a naïve unqualified exposition of his secret as emanates from the representative of the *New York World*. In the meantime, pending the report of the Vienna Academy of Sciences, I venture to surmise that Dr. Schenk's hypnotic powers are more efficient than is his capacity to prescribe nourishment for a mother which will ensure 5,000,000 instead of 4,000,000 corpuscles to the cubic millimetre of her progeny's blood. Moreover, I venture to scout the possibility of devising any scheme of nourishment which will enable a human mother to determine the sex of her offspring. I say that if there can be such human determinism, it will have psychical origin, as hypnotic suggestion.

Let us now devote a little attention to the phenomena of sexuality, more from the standpoint of psychology than we have hitherto considered them. The psychical phenomena involving the sexual affinities—male for female; female for male—from my standpoint, are the product of soul-fiats determining the respective sexual structures. These structures are not confined to what are conventionally understood as the generative organs, which really play a

subsidiary part in the phenomena of sexuality. These phenomena, like all other so-called functional activities of the physiological structures, are primarily nervous, depending on soul-fiats energising through the cerebral system. In the case of sexuality, this is rendered obvious by the facts of abnormal and perverted sexual impulse involving, according to theology, torrid experiences in a certain undesirable habitat, and, according to legislative wisdom, criminal offences of the most odious sort. Regarding the true nature of "crime," I need scarcely stay to indicate to my readers, legislative wisdom is, at present, hardly less oblivious than is theological wisdom to the true nature of "sin." Let us now scientifically scrutinise one of these "sinful" and "criminal" manifestations, and so, perhaps, help to abolish some of that hypocrisy and ignorance now disfiguring us, individually and collectively.

In rare cases, there exists maladjustment between the generative and nervous systems. From this issue abnormal sexual affinities—man for man; woman for woman. In such cases, the normal correlation of cerebral and generative structures is abolished and there results what is called sexual inversion, or homosexuality. Thus, there may be a male generative system combined with a female psychic or cerebral system; or, a female generative system combined with a male cerebral system. This sexuality of the cerebral system may, apparently, only colour the sexual function, or it may affect the whole nervous "tonality." In the latter case we get

the woman, masculine not merely in respect to sexual emotion, but in regard to physical appearance and general mentalisation. Similarly, we then get the female man. In such cases, the generative organs themselves, instead of determining the sex, virtually contradict it. I venture to assert that, in all cases, these organs are indication of sex, not through any inherent determinism of the organs, but merely because, in the vast majority of cases, the organs happen to be correlated with the corresponding cerebral system.

Sometimes, the generative and secondary sexual organs are, within themselves, abnormally correlated as to constituent parts. Then their sexual character is correspondingly obscured. Thus, in the case of the psychically homosexual man, there may be an approximation to the female figure and secondary sexual parts, and an incomplete development of the characteristic male generative organs. In the homosexual woman, the converse may occur. Obviously, in such cases, the same cause (formative soul-fiat, or, to adopt biological nomenclature, germinal determinism) which involves the cerebral abnormality and consequent psychical sexual perversion also involves the structural abnormalities of the generative and secondary sexual parts. Whether the formative soul-fiat causes abnormal correlation between the brain and some other organs ; between certain constituents of the brain, apart from other organs ; between certain constituents of organs other than the brain, does not affect the demonstration of the (relatively)

prime cause of such abnormalities. One point may be here noted. It is often overlooked that abnormality does not necessarily involve morbidity, and that it may be precursory of future evolutionary changes. Naturally, a society such as ours, in an infantile state of ignorance (judged by the latest evolution of human apprehension) regarding the fundamental conditions of human volition, oppresses the perverted sexualist as it oppresses various other units, forced, through hereditary determinism, to diverge from the norm. Accordingly, the sexual pervert, as an hereditary criminal, is "unfit." On the other hand, whether his present "unfitness" may not presage a future "fitness," involving what I may term a non-procreative social element, intermediate between the two sexes, is a point, I surmise, which may interest some future generation feeling, more acutely than does ours, the rigour of the population question. Whatever may be said by knowing folk who set up as critics of what they call nature, I venture to affront these *cognoscenti* by the confident assertion that "nature" makes no mistakes. If she produces an "unfit" type, the "unfitness" only consists in the fact that she produces other types who imagine that there is but one standard of "fitness"—their own. "Nature" chuckles at her Gothamites and goes on producing her "unfit." Personally, I may avow that I feel as much repugnance to the perverted sexualist as to the sexually normal hereditary criminal. Nevertheless, I can contemplate objectively. As an objectivist, I should coincide more

completely in the verdict of society against these "sports," could I believe that society itself had qualified for the *rôle* of judge by emerging from the *rôle* of criminal. One is apt to feel sympathy for the prisoner when one believes the judge is cheating the gallows!

In the case of inverted sexuality, while the cerebral system excites the soul to fiats involving one category of sexual emotions, the generative system is adapted only to fiats involving another category of those emotions. Under such abnormal conditions, men are sexually attracted to men, and women to women.

Like all other instincts, the sexual is a form of type-memory. Originally, this memory was asexual. Later, it became differentiated, at one of the various cataclysmic, creative interferences to which I shall later advert. The differentiation involved is, however, structural, not spiritual. The soul is asexual, though, as structural differentiation, it involves the excitation of sexual soul-fiats by the cerebral system. The sexual organs, as such alone, are merely the machinery by which the cerebral sexual differentiation normally manifests itself. They have no effect on the psychical initiation of sexuality. A familiar illustration of this is afforded by the case of eunuchs, who preserve their sexual appetites. Again, as this generative "machinery" as well as the cerebral propelling agency are products of the soul-fiat, and as this cerebral "propeller" is, itself, dependent on the soul for the fiats involving its propulsive effects on the generative "machinery," it is obvious that, in the case of homosexuality, there is maladjustment,

or, at any rate, abnormal adjustment between the cerebral propeller and the generative machinery. Hence, on the conditions, the sexual fiats excited by the cerebral system, while they involve the functional activity of the generative machinery, are abortive because they do not involve normal affinities. The cerebral propeller then propels, and the generative machinery then responds; only the propeller then moves the wrong sort of machinery, and the machinery responds to the wrong sort of propeller. These conditions are evidence for my thesis that the brain is, intrinsically, no more a conscious agent than is the liver or generative system—that all functional organs, divested of spiritual impulse from the soul, are inert “matter,” or, rather, as no “matter” is really inert, we will say, are “dead matter.”

Aberration of function, such as that we are now discussing, is only explicable on the assumption that the brain does not think but feels thought. The brain is as factor in action, merely what I may term a viaduct for impulses from the soul. As one form of these impulses, sexual “love” is experienced by the brain, according to the soul’s *formative* fiat. Again, this “love” is transferred to the generative structures, according to the brain’s structural character. So far as the brain is concerned, the sexual character of the generative structures to which it has to convey the soul’s impulse, is immaterial. Thus, blindly obeying the soul’s mandate, the brain (in the abnormal sexual cases) automatically deludes, as it were, its generative coadjutor by impelling it to

function through an ill-adapted stimulus. While the brain of the homosexual man, as it were, thinks he is a woman (*i.e.* is conditioned by soul-fiat involving the sexual emotions of a woman), the generative organs, on the other hand, "think" they are those of a man (*i.e.* are conditioned by brain-stimuli exciting their normal reflex functions). Conversely, the brain of the homosexual woman thinks, as it were, that she is a man, while the generative organs "think" they are those of a woman.

Thus, the brain no more initiates its sexual experiences than the generative organs initiate theirs. Both are mere vehicles for impulses. Did the brain really initiate thought, that it should thus sexually delude itself would be impossible. Again, that the soul combines a male cerebral with a female generative system, or *vice versa*, shows the asexuality of the soul and the extrinsicality or non-essential transitoriness of body. Sex is thus one phase of the soul's fiat, and sexual attachment is the product of the particular differentiation of that fiat, involving a male, female, or hermaphrodite cerebral system, irrespective of the character of the generative organs, though these are normally adapted to the cerebral sexuality.

CHAPTER IV

TELEOLOGY

SOME evolutionists talk of the phenomenal world as being a chance product of mechanical, as distinct from intelligent, determinism. Such talk is in the clouds. We know nothing of "chance" except as implying contingencies transcending our powers of identification. We find that every effect of the existence of which we can trace the genesis is absolutely determined by other effects. Accordingly, if we infer from experience, we must deny that any effect can exist apart from such determinism, and we must include the cosmos itself as among effects—in other words, as being as completely a product of determinism as is any particular effect we perceive as within the cosmos. If we deny this determinism to the cosmos, as a whole, we simply project the cosmos into the transcendental concept which the mechanical school ridicules when the "supernaturalist" applies that concept to Deity. A supernatural Deity is no more outside empiricism than is a supernatural cosmos. Moreover, while the assumption of a

supernatural cosmos is diametrically opposed to what we empirically apprehend *as* the cosmos, a supernatural Deity is the inevitable corollary of what we so apprehend. By a compulsory intellectual synthesis, we are prevented from staying our inferential process at the ultimate point of phenomenal empiricism, and are irresistibly driven into a mental arena involving percipience of a factor transcending causation. If we could rationally satisfy ourselves that the cosmos constituted this factor, of course the cosmos would be then equivalent to Deity. However, as I have shown in this work, we are utterly unable to render credible such an hypothesis, which is diametrically opposed to the whole of our experience organised as science.

Again, when this mechanical school denies intelligence as conditioning the cosmos, the implication is that, as humanity cannot discern an intelligible end, there is no intelligent determinism. This school first bemuddles itself with a word—chance, which it incarnates as a thing; then it infers from this sounding nothing that itself (the school), a mere product of this imagined “chance,” is warranted in repudiating intelligent determinism, because it (the school) cannot discover by its own “chance”-imposed factor which it calls intelligence, a cosmical end such as this intelligence would impel the school to make its own end. Surely never was a “chance”-product more presumptuous than is the “intelligence” of the mechanical school! We might reasonably ask such a school, born by its own implication, of

accident, at least to avoid dogmatic pronouncements belittling cosmical determinism as lacking purpose because purpose does not exist to the apprehension of this school. Being, by its own confession, offspring of "chance," what rational right has this school to make any pronouncement regarding cosmical purpose? Indeed, what right has it to pronounce about purpose in anything? Discussion by this school as to fortuitous or purposeful determinism seems to me as futile as would be discussion by a congenital idiot regarding purpose or lack of purpose in a mathematical demonstration.

By first implying that everything—its own "intelligence" included—is product of "chance," this school cuts itself away from any intellectual foundation for argument for or against cosmical purpose. As the "purpose" of this school, on its own showing, is non-purpose—"chance," the word purpose, and with it, the word intelligence, have no rational significance. If chance is the antithesis of purpose, and the universe is a chance-product, then human intelligence is a chance-product and purpose does not exist. *Ergo*, to discuss purpose is futility.

What the mechanical school really implies is that the cosmos is full of purpose and intelligence, but that it (the school) alone among cosmical products can actively manifest purpose and intelligence. What this school—according to the implication—has never accomplished as manifestation of purpose or intelligence is neither! If there be such an entity as Deity, unless this school can identify purpose and

intelligence in the method of the Deity, then is the Deity a blind, floundering nondescript, and what, as the mechanical school, issues from this nondescript is the only product that knows what it is about ! The mechanical school appears to me excessively comic.

It seems to me that naturalists and materialistic philosophers who discuss the question of purpose, as being at the root of creation, ignore one all-important consideration—that purpose of God, as “nature,” to our apprehension when thoroughly exerted, is not manifested in adapting individual products to what is called environment, *but, in so changing environment that particular products unsuited to the environment are eliminated, and others arise suited to the environment ; that the “purpose” is involved, not primarily in the organisms, but in the environment.* This consideration has been forcibly impressed on me during a re-perusal, after several years, of Huxley’s chapters on the *Origin of Species*, and on criticisms of that work by various naturalists, in *Lay Sermons*, (Macmillan, 1891).

Huxley stoutly contests the assertion of Kölliker and others that Darwin is a teleologist. Huxley writes that Darwin “does *not* affirm that every detail in the structure of an animal has been created for its benefit.” Huxley implies that this lack of affirmation by Darwin constitutes him no teleologist. Thus, he (Huxley) writes : “But it is one thing to say, Darwinically, that every detail observed in an animal’s structure is of use to it, or has been of use to its ancestors ; and quite another to affirm, teleologically,

that every detail of an animal's structure has been created for its benefit" (*Criticisms*, p. 265). Of course, in the narrow, theological sense of the term, Huxley's answer is sufficient. However, it is quite irrelevant to the question of teleology, *if we regard environment as the criterion of purpose, and particular products of creation, but as the incidents which have to appear or disappear, conformably with the decree of God's will manifested as environment.* Then, the question, teleologically, is, not whether "the structure of an animal has been created for its benefit," but, is the will of Supreme Mind effectively exercised by eliminating what environment does not require?

From this standpoint, Darwin is indubitably, in the words of Kölliker—though not according to his interpretation of teleology which is the same as Huxley's—"in the fullest sense of the word, a teleologist," inasmuch as the basical implication of Darwinism is that environment attains what it wants by eliminating what it does not want and fostering the variations which "spontaneously" arise and involve "adaptation." Transfer the notion of "purpose," from morphological and physiological details, to all the circumstances and conditions affecting organisms, Darwinism means teleology if it means anything.

When we apply Darwinism to society, we must remember this important point: what constitutes "fitness" during one environment, may constitute "unfitness" during another environment. If God

has now decreed—as I think I have rationally shown to be the case—that a new environment, displacing that involving evolutionary “survival” through mere brutish “struggle,” shall condition civilisation, then, consistently to apply Darwinism, we must grant that those types of humanity (or, we will say, those activities, inasmuch as activities, rather than individuals, are what social evolution, through intellect, is now modifying), adapted to the effete condition of brutish “struggle,” must succumb in the “struggle for life,” in order to enable civilisation to conform with what intellect now tells us is a new environment involving the prevalence of scientific justice.

So far as regards civilisation, the “struggle for life” is only apparently between individuals. Really, that “struggle” is now between environments, involving that one decree of God has superseded another. This has, no doubt, always been the case, though the fact has never been obvious to human understanding until post-Darwinian science, concerned with germinal determinism (Weismannism), and the philosophical elaboration of physical concepts regarding time, space, matter, motion, revealed the superficiality of all conceptions of “nature” positing, as causal explanations, what were merely crude observations of effects. We can now see that, in the illustrations, by Darwin, of changes of organic species, through “natural selection,” and “spontaneous” variation, the “struggle” between individuals is merely an effect, not a cause—that, behind this “struggle” of individuals is the “struggle” of

environments decreed by God to condition the universe. Divine teleology is thus manifested, to our present apprehension, on a vaster scale than was apprehensible to those who measured that teleology by the inadequate standard of "natural selection."

That, morally, morphologically, physiologically, organisms are not changed by the "heigh presto" method, to ensure conformity with a newly decreed environment, does not involve that God, as nature, makes mistakes (as many clever critics of "nature" and sceptics regarding God tell us is the case); the facts merely involve that we, clever mites, make mistakes by presuming to measure God's will by our own clever notions of expediency. Darwin's premises and inferences, in the light of later demonstration, are totally inadequate to support the materialistic *châteaux en Espagne* erected by a number of his interpreters whose wish is father to the thought that supreme purpose does not condition the cosmos. Darwin, himself, was too big, mentally, to indulge in the wild dogmatism characteristic of many of his disciples. He saw the "fly in the amber" when the issue was: Does natural selection exclude God? So did Huxley, notwithstanding his attempts to disprove teleology. In England, at any rate, only an *élite* of quidnuncs and a common ruck of ignoramuses now invoke Darwinism as authority overriding the intellectual demonstration of God's determinism.

If time is, as I shall show to be the case, only a product of our relativity to objects of sense, then, in

respect to Deity, outside relationship, all is what we understand as present—the universe ever *is*, never *was*. God *wills*; He does not scheme and contrive. Therefore, whatever occurs cannot possibly involve failure, though, to us, as an issue of our God-decreed limitations, there is the appearance of maladaptation to end. What we call science is only a record of happenings. It affords us no measure of “nature’s” (God’s) purpose or incentives. It merely—when applied illegitimately—posits the philosophical absurdity that God’s purpose is to be judged by human standards of expediency. Huxley, himself, illustrates what I am emphasising by the following words:—“Suppose, for example, a return of the glacial epoch and a spread of polar climatal conditions over the whole globe. The operation of natural selection under these circumstances would tend, on the whole, to the weeding out of the higher organisms and the cherishing of the lower forms of life” (*Criticisms*, p. 267). Here, the “higher organisms” would be equivalent to the useless “rudiments” of organs of individual organisms. That these “higher organisms” were superseded by the “lower forms of life” adapted to the new conditions would transform the “lower” into “higher.” What we consider “higher” has no significance in the absolute sense. Nature’s (God’s) purpose would be manifested by the change of environment equally as by the states of any particular products of creation. “Nature” (God) would manifest purpose by conditioning the lesser (individual organisms) by the greater (environment)—

the whole would condition the part ; God's purpose does not work on the scale of humanity.

Huxley tells us : " For the teleologist an organism exists because it was made for the conditions in which it is found ; for the Darwinian an organism exists because, out of many of its kind, it is the only one which has been able to persist in the conditions in which it is found " (*Criticisms*, p. 263). Either assumption does not affect the essential crux of supreme purpose. Whether organisms are specially made for conditions or are eliminated when they do not conform with conditions, the organisms are really part of the conditions. These conditions, not any particular part of them, constitute the object of the purpose. True teleology asserts that everything must be purposeful because everything is the product of one sole determining origin. To assume that everything is not purposeful is in the connection to deny that anything is purposeful. An organism is not imperfect, involving a failure of purpose, because it is not adapted to its conditions. What involves God's purpose being, in Huxley's words, " the conditions in which an organism is found " (environment), obviously, part of that purpose is that some organisms are not " adapted " when environment changes. Even according to conventional scientific standards of possibility, we must recognise that were all organisms equally indifferent to change of environment (*i.e.* equally " perfect," or " adapted "), there could be no organic change, unless we adopted the spurious theological teleology of " special creation."

Huxley again writes: "According to teleology, each organism is like a rifle bullet fired straight at a mark; according to Darwin, organisms are like grapeshot of which one hits something and the rest fall wide" (*Criticisms*, p. 263). I grant that, "according to teleology, each organism is like a rifle bullet fired straight at a mark." What I deny is that Darwinians know the "mark" at which organisms are "aimed," and that it is rational for them to apply their little tapes to measuring "nature's" purpose. I say that if, according to Darwinism, "organisms are like grapeshot of which one hits something and the rest fall wide," then Darwinism involves huge fallacy. I say that none of the "grapeshot falls wide," but that every "bullet" has its "billet." I say that, did every organism "hit the mark," in the sense implied by Huxley, there could be no "evolution" for Darwinism to interpret. Darwinism, as Huxley puts it, here errs because it cannot identify the "marks," and propounds "marks" that do not exist outside unlicensed imagination.

So far as regards creative purpose, it does not matter whether we accept the "bullet" or "grapeshot" contingency. "Purpose" and "chance" only exist in ourselves, as concepts. Therefore what caused us, caused "purpose" and "chance." If we act of "purpose," we act by determinism of what has endowed us with "purpose." If we act by "chance," we act by determinism of what has created the contingency of "chance." If we say that "purpose" is in us, but "chance" originated us, the "chance"

still needs originating as much as we do. Then, what originated "purpose," originated "chance." On what grounds are we to assert that originating "chance" did not involve "purpose"? This topic will be further discussed in later chapters dealing with Deity. To attempt to decide the question of teleology by Darwinian empiricism is equivalent to trying to measure the distance of a fixed star with a yard-tape.

What is called nature's waste is considered by the Materialistic school a strong point against creative design. In the previous chapter I dealt with one aspect of the contention involved in the non-fertilisation of germ-nuclei by sperms. Fertilisation, as indicated, being a volitional phenomenon, of which mechanical admixture is but an incident, the failure of sperms to reach germs merely involves that there has been no fiat for procreation. However, there are many cases of apparent waste to which this reasoning will not apply. To take a typical instance: A vast number of young oysters are swept away by currents and so destroyed. Superficially viewed, this involves waste. However, the case is easily disposed of when we take a wider view of the circumstances. Currents being designed, as well as oysters, it is obvious that purpose is as efficiently manifested in adapting the number of oysters to currents as would be the case in adapting currents to oysters—so as to allow every young oyster to develop so far as currents were concerned. As it is, currents are designed to sweep away oysters and oysters are designed typically to persist. Both ends

are achieved. Accordingly, the argument for design is not affected by the facts. There is no waste because the design involves a certain environment (currents) to which oysters have to be so adjusted as typically to persist. Waste, in the connection, involves failure to secure a certain end by the greatest economy of means. It is manifestly, on the conditions, absurd for creatures to pretend to decide what is the greatest economy to the Creator.

Unless we can demonstrate spontaneous existence within the universe, or as the universe itself, the very fact of existence involves all we can apprehend as purpose. This purpose, as Divine Will, need not involve what we conceive as design, in the sense of limitation by an end. All being present to the Divine Will, what we conceive as end is ever immediate consummation. Beginning and end, in the connection, are one and the same. To apply to Deity our notion of intelligent design, involving striving for a future consummation, is to bemuddle ourselves by attributing absolute significance to what is merely a product, as conceptualism, of our limited conditions. Assuming the universe to be created, a part of the universe, as an organic type able to conceive intelligent purpose, is the issue of the Will that determined the whole. It is no more rational for such a type to apply its concept of purpose to deciding the character of the creative Will, than it would be rational for the type to apply its own physical form to deciding a form for the Creator, as is done by traditional theology. Even though we

discover what we can recognise as intelligent design in nature, the discovery no more involves that such design is really creative method, than the fact that we discover lack of design in lunatics involves that insane caprice is creative method. To apply our own measures of intelligence to depreciating the purpose of the Creator, is to show ourselves very lacking in the only sort of intelligence about which it concerns us to be solicitous.

CHAPTER V

MATTER ACCORDING TO PHYSICS

ACCORDING to the mechanical theory of the universe, every phenomenal difference of inner constitution, contour, property, manifestation between material objects is ultimately resolvable into difference in the grouping and motive endowment of certain units of mass. In assuming motion as an endowment of these units, physicists imply that motion is entirely distinct from mass, and the latter is absolutely indifferent to motion—that is, motion may enter and leave mass without affecting its nature. Physical science does not concern itself with the cause or causes of such grouping and endowment of mass-units, or of the origin of mass and motion. Such questions the physicist leaves to the ontologist, whom, I may incidentally observe, physicists often treat with a certain air of tolerant superiority.

Beyond telling us the above “facts” regarding mass and motion, physicists tell us that mass (sometimes wrongly called matter, this being a combination of mass and motion) and motion (called energy)

cannot be destroyed—that is, they cannot go out of the universe. By universe physicists mean the phenomena or so-called natural events which we can subjectively apprehend, or about which we can scientifically speculate. Thus, from the physicist's standpoint, this universe must be considered as a sort of box containing everything that exists. Whether there is anything behind this "box," the physicist, as such, does not trouble himself to decide.

When physicists postulated their fundamentals regarding mass and energy, another science, biology, dealing with organic, much as physics deals with inorganic, products, was but in the womb of time. Consequently, the considerations which I have advanced in the preceding chapters, derived from biology, and which I am now going to clinch by others, derived from physics and chemistry, against these physical fundamentals, were not within the conceptive powers of humanity.

A fundamental proposition, on which is based the modern mechanical, or physical, theory of the universe, is that ultimate mass is composed of absolutely homogeneous, identical particles, called atoms. These mass-atoms are absolutely impenetrable, and, consequently, inelastic, because elasticity involves the capacity for internal motion, and what is absolutely impenetrable cannot have internal motion. Again, these mass-atoms are absolutely inert—that is, they have, inherently, no predisposition either to mobility or immobility.

Another fundamental postulate of physics, corollary

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to the above, is that motion is absolutely distinct from mass, on which, however, it is universally impressed. This combination of motion with mass, physicists call matter. Matter is thus mass "vivified" by motion.

The above assumptions of the science of physics are absolutely inconsistent with a multitude of empirical and theoretical results, from which have originated some of the most important and comprehensive subsidiary generalisations known to physicists and chemists. They are absolutely inconsistent with the very foundation (Avogadro's law) of modern chemistry. These contentions I will now set myself to prove, if in a cursory, still I hope, a conclusive manner. First, I will bring physics as witness against physics; then bring chemistry as witness against physics.

What is known as the kinetic theory of gases posits that gaseous molecules are in a continuous state of agitation, and that the motions are rectilinear. Necessarily, the molecules must collide, as they move in all directions, within a system. Now, it is obvious that, were these molecules perfectly rigid (as posited of atoms by physics), their kinetic energy, or translatory motions, must soon cease. Then there would be no gas. Accordingly, the kinetic theory of gases cannot dispense with the assumption of perfectly elastic particles. But, as these particles, in the cases of several gases, can be no other than atoms, or the physicist's ultimate units of mass, they must, according to physics, be perfectly *inelastic*.

It is evident that physicists must be wrong in their

kinetic theory, or wrong in their atomic theory. They cannot have atoms both "perfectly" rigid and "perfectly" elastic. Still, their mechanics requires atoms perfectly rigid, and their kinetics requires atoms perfectly elastic.

I will now turn to another perplexing assumption of the physical specialist. The mechanical theory scouts the assumption that one body can affect another except by physical contact. Thus, a body cannot affect another through absolute void. If mechanical physicists (who, I may remind the reader, represent the only school which has rendered physics a science) had granted that bodies could affect one another through void, they would have posited super-mechanical (or, in the connection, supernatural) influence.

Now, if bodies can only affect one another through physical contact involving the conveyance of motion, it is evident that some assumption must be invented to account for the conveyance of effect from or to bodies separated by "space." We are compelled to believe that bodies do affect one another, or are affected through "space." Therefore, according to physics, "space" must not be our conventional abstraction, but a solid something. We call a main effect of this physically assumed solid something, on other somethings—gravitation. The conventional notion that gravitation involves what is called attraction, or a *pulling* energy, is directly contrary to the physical fundamental postulate denying action at a distance. This necessitates that gravitation shall be

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a *pushing* energy, and as absolute void cannot be conceived to push anything, physicists have invented a "medium" which, so they posit, can push every body towards every other body.

For my present purpose it will suffice to quote the utterance of two leading modern physicists, Balfour Stewart and P. G. Tait, regarding the impossibility of accounting for gravitation, except on the mechanical hypothesis of physical contact, involving push. These physicists state, in *The Unseen Universe*: "All attempts yet made to connect gravitation with the luminiferous ether, or the medium required to explain electric and magnetic distance-action, have completely failed, so that we are apparently driven to the impact theory as the only possible one." Now, a thing cannot be pushed by another thing which has no momentum. And, as all other things are within this ether, and are assumed to be pushed towards one another by that ether, it is obvious that the ether must, in some way, itself move in relation to the bodies it contains. This, again, involves that parts of the ether must move in relation to other parts. This, again, ultimately means that such an ether must be composed of moving particles. In other words, it must be analogous to an ordinary gas. Hence, the objections applied to elastic gaseous particles, as contradicting the fundamental assumption of the impenetrability of matter, apply to such an ether.

The only hypothesis seriously considered by physicists to account for gravitation is that known as Le Sage's. Instead of the ether, this assumption requires

what are called ultra-mundane corpuscles. These I take the liberty of suggesting to the reader's imagination as the omnipresent, inconceivably small, and swiftly moving shot of a cosmic mitrailleuse. By their different pressures on opposite sides of sensible bodies, involved in the relative positions of those bodies enabling them to act as screens to one another, the "shot" are assumed to batter together the constituents of the universe. That involves gravitation ! Here is what one of the leading lights of mathematical physics tells us about these corpuscles : "In addition to these grosser particles which are the atoms of tangible or sensible matter, infinite as these are in number, there is an infinitely greater number of much smaller ones darting about in all directions with enormously great velocities. Le Sage showed that, if this were the case, the effects of their impacts upon the grosser particles or atoms of matter would be to make each two of these behave as if they attracted one another with a force following exactly the law of gravity. In fact, when two such particles are placed at a distance from one another, each, as it were, screens the other from a part of the shower which would otherwise batter upon it. If you had a single lone particle, it would be equally battered on all sides ; but when you bring in a second particle, it, as it were, screens the first to a certain extent in the line joining the two ; and the first, in turn, screens the second, so that, on the whole, each of these two is battered more on the side opposite to the other one than it is on the side next the other

one ; and, therefore, on the whole, there is a tendency to bring the two together by the excess of battering outside over that inside. Now, it is a very easy mathematical deduction to show that the result of this is equivalent to an attraction, inversely as the square of the distance, and, therefore, that it exactly agrees with the law of gravity. It is necessary also to suppose that particles and masses of matter have a cage-like form, so that enormously more corpuscles pass through them than impinge upon them, else the gravitation action between the two bodies would not be as the product of their masses. . . . With a little further development, the theory may perhaps be said to have passed its first trials, at all events, and, being admitted as a possibility, left to time and the mathematicians to settle whether, really, it will account for everything already experimentally found. If it does so, and if it, in addition, enables us to predict other phenomena, which, in their turn, shall be found to be experimentally verified, it will have all the possible claim on our belief that any physical theory can ever have" (P. G. Tait, *Recent Advances in Physical Science*, pp. 299-300).

Note these words : " If it . . . enables us to predict other phenomena, which, in their turn, shall be found to be experimentally verified, it will have all the possible claim on our belief that any physical theory can ever have." These words express the final sanction of not a few hypotheses of the sort. It is evident, as all phenomena are the products of an ordered sequence of events bound "together by

mutual dependence, that if an hypothesis seems to explain one series of phenomena, it will very likely serve the same purpose with regard to another allied series, and may, moreover, as a logical process, enable us to forestall empiricism regarding such allied phenomena. However, to contend that such results turn mere guesswork into real explanations seems to me not a little hazardous.

It may be instructive to append to the above conclusions of Tait regarding Le Sage's corpuscles the conclusions of another equally eminent mathematician, Clerk Maxwell. He shows that, assuming the corpuscles are perfectly elastic, there can be no such action as Tait postulates; and that, were the corpuscles inelastic, their impacts would generate heat, which "would in a few seconds raise . . . the whole material universe to a white heat."

Further, I would ask, how can this corpuscular assumption meet the fact that molecules impacted as a solid are of the same weight as the same molecules separated by large distances (in respect to the corpuscles) as a gas? Again, if ordinary matter-atoms have to be battered to constitute gravity, the corpuscles which batter these atoms must also themselves be battered, or be endowed with some supernatural attribute of inexhaustible motivity. What sort of explanation is this of gravitation? Does the earth, as constituting a centre of gravity for all matter within our empirical experience, monopolise what is called gravity, or is gravity universal? The implication of science is that gravity is universal. Then,

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there must be some centre for all gravity, to which all bodies tend, and if these ultra-mundane corpuscles push or batter molecules towards the terrestrial centre of gravity, they must batter planetary molecules (exclusive of the earth) to centres of gravity within those planets. Moreover, if gravity is universal, these planets themselves must be battered towards a solar centre of gravity, and the sun itself must be battered towards some other centre of gravity, and so on, *ad infinitum*, among the stars.

This corpuscular hypothesis of gravitation assumes, as given, the vast amount of energy expended every moment by the corpuscles. Whence comes this energy? It needs accounting for as much as does gravitation itself. If we assume gravitation to be this corpuscular battering, we are no nearer a real interpretation. Moreover, if any hypothesis like Le Sage's is taken to account for gravitation, it abolishes the possibility of what is called potential or stored energy, and constitutes all energy kinetic. On the other hand, modern science asserts that practically all physical changes are dependent on the storage and expenditure of energy, as respectively potential and actual motion—the one being transformed into the other.

There is no tenable theory of gravitation able to obviate "action at a distance," as attraction through void, and yet the denial of this attraction is implied by all mechanical theory; while, on the other hand, the whole of empirical science proves that action at a distance, as gravitation, does exist, and that it takes

place out of time, is inherent indifferently to every kind of sensed matter, never ceases, is never exhausted, and never changes. Thus, it is essentially different from every other form of energy known to science, each of which can be changed into another, requires time for transmission, is not inherent indifferently to all kinds of sensed matter, may be transferred from one to another body.

From my standpoint, gravity is to dead, or inorganic matter, what common sensibility involving motor reflexes is to living organic matter. Gravity is the basical response of the "soul" of the inorganic, to environment, as common sensibility is the basical response of the soul of the living organic, to environment. When I come to deal metaphysically with soul, time, space, I shall show that the soul energises out of time and space in imposing fiat, or will, on the organism, and that this fiat is the foundation of what we apprehend as emotion, thought, sense-experience, all of which take place out of time and space. In an analogous way, from my standpoint, gravitation is a manifestation of inorganic matter, out of time and space. It is the analogue, in the sphere of the inorganic, to common sensibility, in the sphere of the organic. It is different from the ordinary energies of physics (light, electricity, magnetism), as common sensibility is different from the specialised sensations and emotions (love, hate, touch, sight, thought, etc.) of the organic. Again, as behind specialised organic sensations is unsymbolisable sensation, so behind gravity itself is an analogue or

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this unsymbolisable sensation, in the realm of the inorganic.

The perceived root of the special physical energies or inorganic "emotions" is "gravity." The perceived root of the special organic sensations is common sensibility. Behind both is the unsymbolisable sensation of the organic living, and the inorganic dead. So long as the inorganic system has gravity, it lives the inorganic life. So long as the organic system has common sensibility, it lives the organic life. When we remove an inorganic system away from what is called the terrestrial centre of gravity, we do something analogous to narcotising an organic system, and so reducing its common sensibility. If we could entirely deprive an inorganic system of gravity, we should do the equivalent of separating the somatic elements, or body, of an organic system from its soul. In other words, we should kill the inorganic, as we should kill the organic.

Physicists find an atomic ether inadequate to account for the phenomena of light, electricity. This ether must be what they call a perfect fluid. Perhaps they are able to imagine such a fluid. I can assure the reader that I cannot. I daresay the reader will pardon my lack of imaginative faculty when I inform him that this perfect fluid fills all space, penetrates all matter, exerts at each point in space an elastic force 1,480,000,000,000 times that of the atmosphere, and a pressure on the square inch of 17,000,000,000,000 pounds; and yet we move freely about in it without the faintest physical perception of its existence.

We are told by physicists that nothing is more certain than that matter-atoms are indestructible. This means that the mass of every sensible object, no matter into what varied forms it may become transmuted, always represents the same number of mass-units. I will now try to show that, in addition to telling us this, physicists tell us that matter-atoms are *not* indestructible.

By the indestructibility of matter we are to understand that no phenomenal effects can alter its unitary constitution. The great empirical proof of this indestructibility is the fact that no physical or chemical process can affect what we call the weight of a specific quantity of matter. This "weight," according to physics, is the effect of that mysterious agent (gravity) which I have just considered, on the atoms of sensible objects. Without this effect such objects could have no "weight"—that is, all concrete objects would, to our apprehension, become transformed into imponderable, impalpable phantasmagoria.

The proof of the above statements regarding the effect of abolishing gravitation is one of the most cogent offered by physics. It is the simple and comprehensive demonstration that the further an object is removed from the terrestrial centre of gravity the less is the specific gravity, or weight, of that object. Thus, if we swing a pendulum at the top of a mountain we find that it oscillates more slowly than at the foot. Applying this induction to its logical extent, we must grant that, could we remove an object beyond the range of this gravitation, that

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object would become a "ghost," which, assuming we could see it (which, however, on the physical hypothesis and physiological grounds, we could not), we could not feel.

From the above considerations regarding physical gravity, it will be seen that, in the connection, physicists themselves postulate the same essential ghostliness which I have attributed to matter. Weight is merely an accident in the existence of mass, depending on the fact according to physics, that no body exists which is unaffected by the gravitational mitrailleuse, failing which, the universe would become, as ponderable matter, annihilated, or "nothing."

It may be urged that my assumed contingency of removal from the sphere of gravitation is inadmissible, inasmuch as it would not be a phenomenal effect. I reply that swinging a pendulum at the top of a mountain is a phenomenal manifestation, and that matter, in the shape of its equivalent, weight, does then disappear as a phenomenal effect. Moreover, the converse is true: when we swing the pendulum at the bottom of the mountain, mass, as its equivalent, weight, then comes into existence as a phenomenal effect. For, if mass, without weight, is phenomenally non-existent, then weight differentiates immateriality from matter as mass; and as the position at the bottom of the mountain increases weight, it increases matter. Thus, even on the physical hypothesis, matter, as mass, comes into and goes out of the phenomenal universe. Again, as

according to physics, all mass had a primordial endowment of motion, without which it could not exist as matter, if carrying the pendulum to the top of the mountain has demonstrated the destructibility of mass, I think we must, logically, grant that primordial, as distinct from extraneously imposed, motion of that vanishing mass must have gone with it. Conversely, with the reappearance of mass at the foot of the mountain, the primordial motion must have reappeared with it, to constitute it matter.

The above considerations regarding gravity will show that to postulate that mass is indestructible, on the basis of empirical demonstration that its weight cannot be destroyed, really involves a conclusion based on incomplete *data*. We then assume that weight exists *absolutely*, as inherent to mass, whereas, the correct statement is that weight is merely what we experience sensually as a condition of place-relationship between matter-systems, and that, could we isolate a matter-system, it would have no weight. It may be urged that, though it could then have no weight, it would still retain its density, as bulk. When I come to consider the question of space, I shall recur to this point. It will now suffice to observe that this quality of bulk, as being inherent to matter, is, again, in the strict sense, not an experiential *datum*. Certainly, by mechanical means, we cannot, beyond a certain degree, alter the "spatial" relationship of any matter-system, that is, we cannot compel it to occupy less than a certain "space." However,

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when we apply chemical processes, we find that our mechanical methods afford no reliable measure of the "compressibility" of matter. Thus, we find that various liquids, which no mechanical means can compress, become, at once, less bulky through mixture. Again, gases which exert no chemical action on one another, if allowed to diffuse into the same "space," behave as though each one were the sole occupant; in the words of Dalton, they "pass into each other as into *vacua*." Thus, even from the mere physical standpoint, we must acknowledge that, whatever "bulk" may mean, we cannot, as a *datum* of experience, assert that it involves the absolute incompressibility, or impenetrability, of matter.

Various mathematicians have tried to account, by assumed inference from the mechanical laws of physics, for fundamental empirical verifications regarding the nature and actions of gaseous substances. These verifications are embodied in the so-called laws of Boyle and Charles. The mathematical processes supposed to ensure this symmetry between empiricism and theory involve what is called the kinetic theory of gases. These empirical "laws" and the kinetic "theory" depend on the assumption of "perfect" gases. Of such gases, humanity has no experience. They are as purely imaginary as is any conceit to be found in Lemprière. Mathematicians tell us that, were the gases of experience relieved of the perturbing influences which surround them, they would behave in certain ways conformable with mechanical speculation. It will be seen that this

contention involves the assumption that what we, by our rough methods, can experimentally determine about gases enables us also to determine what—to employ biological figure—is “innate” to the gas, and what is merely the “extraneous effect” of environment on such gas. I may state that there is a disposition to apply this arbitrary and abortive method even to organic manifestations. Thence naturally issues the doctrine of the hereditary effects of extraneous influences which is utterly irreconcilable with the researches of biologists into the morphology and physiology of the cell. This application of mechanics to biology involves the very process of arbitrary assumption which mathematicians apply to inorganic matter; both are part and parcel of the “mechanical” school of thought, and both, in my opinion, as living expression of human experience of matter, are doomed to early extinction. The “perfect” germ-plasm of biologists of the Lamarckian school must be the analogue of the “perfect” gas of physicists. They must logically exclude the possibility of any primordial inherent tendency in either the biological, or the physical, unit. Both try to exclude the operation of a First Cause. The “perfect” gas, like the “perfect” germ-plasm, must be absolutely indifferent *primordium*. In view of recent biological verification regarding the structure and function of the germ-plasm, there is no ground for assuming such indifferent organic *primordium*. On the contrary, we are driven to infer that the biological unit was created with *ineradicable*, complicated, and

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highly determinate predispositions. In like manner, I maintain that the primordial units constituting a gas are "hereditarily" determinate products of creation, and that there is no better warrant for the assumption, by physicists, of a "perfect" gas, than by biologists, of a "perfect" germ-plasm.

According to the kinetic theory, we must assume—

1. That the particles of a gas are "perfectly" elastic. This, as shown earlier, is dead against the fundamental mechanical assumption that mass is absolutely homogeneous. Moreover, if admitted, the assumption merely involves a restatement of the fact to be explained—the expansive power of gases. There is simply a transfer to the molecules of the gaseous opposition to constraint.

2. That the particles, in any number of different gases, for the same volume and under the same external conditions, are the same in number. This, again, as will be shown when I come to deal with chemistry, is dead against the fundamental mechanical hypothesis that all units of mass are identical.

3. That these gaseous particles are in perpetual motion, notwithstanding that they collide. This is dead against the fundamental mechanical hypothesis that colliding bodies must lose, as heat, their kinetic energy.

It is empirically proved that practically all gases at constant temperature decrease in volume in direct proportion with the pressure by which they are constrained. This involves Boyle's law. It is similarly proved that a quantity of any gas, under constant

pressure, varies in volume in direct proportion with its absolute temperature. This involves Charles's law. The one law is thus complementary of the other. Boyle tells us what a gas does at constant temperature and under varying pressure. Charles tells us what a gas does under constant pressure and at varying temperature. Both laws apply only to perfect gases, of which we have no experience. Charles's law applies to gases absolutely free to expand. We only know of gases with relative freedom. Thus, we have no experiential knowledge of the conditions presupposed by either law. Moreover, Boyle's law, when applied to gases at high pressures, is found to be only approximately true, and it is one of the glories of the kinetic theory that, by assuming attraction between gaseous molecules only when closely confined by high pressure, it has cracked the "nut" involved in the deviations from Boyle's law. In other words, the kinetic theory arbitrarily repudiates the fundamental axiom of physics, denying action at a distance, and, thereby, corresponds with Boyle's law, which "law" itself is not a law in the strict sense, but a mere hypothesis. Then, chemists glorify the kinetic theory because it confirms Boyle's law.

The kinetic theory having been found untenable, on the assumption of rigid, discrete particles, mathematicians have lately evolved what is called the vortex theory. This was suggested to the inventor, Lord Kelvin, by some researches of Helmholtz, showing that rings analogous to those produced by

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some smokers, if occurring in a perfect medium, would persist indefinitely. This verification of Helmholtz has been elaborated by Kelvin, Larmor, Hill, Thomson, and others into various hypotheses involving imaginary vortex-ethers and vortex-atoms. The mental processes involving the hypotheses, though varying in issues, appear somewhat as follows:—Given light, electricity, magnetism, chemical reaction, gravitation, imagine conditions which will meet the correct mathematical statement of the results of empirical research regarding the phenomena. Call the conditions a perfect fluid containing vortex-atoms, filaments, rings, cells, spheres, according to the demands of your imagination. Then, try to imagine these products of your “inner consciousness” as more real explanation of phenomena than are the numbers, letters, signs which constitute your *formulæ*.

Every current vortex-theory presupposes inconceivable conditions by assuming an omnipresent fluid in motion. This fluid is unimaginable and physically impossible. What is really posited is the absurdity that motion moves or that void moves. What is omnipresent, all-pervading has no parts. What has no parts cannot move within itself. For movement, something must be displaced. What is omnipresent, all-pervading cannot be displaced, because there is no “place” from which it can start moving. The motion attributed by mathematicians to their vortex-atoms and all-pervading fluid can no more resemble the motion of common experience than the “rule of

three " resembles a Cheshire cheese. In fact, whether the imaginary state of the "perfect fluid" and atoms be called stagnation or motion is quite immaterial, so far as regards any mental thing defined by the verbal application.

So long as the verbal symbol, motion, is held to have any significance as a concept, internal motion of a solid fluid involves a negation of significance. The words imply a degradation of speech to the state involved in the physical conception of mass-inertia. The "indifference" of the phrases to all living construction is then complete, and the issue becomes equivalent to the inarticulate mumblings of the congenital idiot. Of course, everybody who knows the perfection of mathematical processes will grant the possibility of constructing some logical edifice which shall meet the required conditions of imagination. However, such achievement is purely ideal, having no value as real demonstration. Yet it is advanced as real.

It may be urged that biological speculation is no better, as real demonstration, than the mathematical procedure of the mechanical school. I reply that the two processes are not analogous. There is the radical difference between them that the mathematical procedure propounds mere formal explanation as though it were real, and does not involve supermechanics; while the biological procedure, rationally elaborated, propounds no formal explanation, and involves supermechanics. The latter method incorporates, as logical verification, what the mechanical

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process ostensibly excludes, while, nevertheless, demonstrating that its own method leads directly to the very conclusion which it makes a show of rejecting. All current mechanical interpretations become futile so soon as they propound, as real explanation, mere formal statements of hypothesis inherently unverifiable by sense-experience. In other words, the mechanical process is only valid so long as it deals with sensuous phenomena. So soon as it advances speculation about the extra-sensible, as quasi-experiential demonstration, it is no more reliable than any other purely conceptual system. Then it practically becomes the same process as the metaphysic of ante-empirical epochs—mere *a priori* subtilisation, admirable as mental gymnastics, but worthless as demonstration.

It is experiential truth that one nucleus, or a combination of two nuclei, issues in an organism depending for all its innate characteristics—whether of contour, bulk, structure, nerve, or visceral function—on certain potentialities in the originating nucleus, or nuclei. It is legitimate inference, almost equivalent to sensual experience, that certain constituents of such nuclei are the material representatives of the potentialities conditioning hereditary characteristics. It is legitimate inference that such nuclei contain integrations of units which, in one fundamental respect—the power to reproduce themselves—differ from all other forms of matter. It is legitimate inference that these units do not multiply through any processes involving incorporation with themselves

of ordinary matter ; and if they so multiply independently of any processes known to physics, chemistry, or physiology, it is legitimate—in fact, we are bound to infer that these units materialise themselves from immateriality, or something that is not akin to what we can apprehend as matter. Here we have a logical sequence of inferences from sense-perceptivity. As to these physical atoms, ethers, perfect fluids, vortices, we have not a scintilla of sense-experience to authenticate any of them. They are mere assumptions to meet imagined contingencies.

When we learn from Maxwell, on the authority of his “statistical” method, that the molecules of any one substance are “unalterable by the processes which go on in the present state of things, and every individual of the same species is of exactly the same magnitude, as though they had all been cast in the same mould, like bullets, and not merely selected and grouped, according to their size, like small shot” ; when we are told, on the same authority, that in a cubic inch volume of hydrogen “bullets” there are 17,750 *millions* of collisions per second of time ; when another authority tells us that Maxwell’s “bullets” are vain imaginings, and the real thing is Thomson’s vortex-filament, which “can be linked on itself ; two or more can be liked together, like helices drawn on an anchor ring ; or, lastly, several can be arranged together, like parallel rings successively threading one another” ; when we objectivists hear these fateful pronouncements, we exclaim with emphatic unanimity,

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“Prodigious !” Then we ask ourselves how much nearer is “atomic mechanics” going to drive eminent mathematicians toward hallucinatory dementia? I maintain that any process involving such definitions of atoms and ethers as are now being showered on the public by eminent physicists is essentially a product of the same mental tendency which impels the emotional pietist to definition of Deity, and that the one product, as definition, is as worthless as the other.

I think I have now advanced enough to show that the physical interpretation of matter, even judged by physics itself, may be compared to a too short blanket. Pull it up to your nose, your legs are bare ; cover your legs, your shoulders are chilled. I will now revert to the consideration of the mutual opposition between the fundamental dicta of chemistry and those of physics.

The application to modern science of the old Greek conception of atoms was first made about 1813 by the Italian chemist, Amedeo Avogadro di Quaregna. Besides originating, or rather resuscitating, the kinetic hypothesis, the law of Avogadro is the foundation of the modern science of chemistry, or what is called the “New Chemistry.” This started its evolutionary career about thirty-five years ago. Thermo-chemistry, based on the dynamic hypothesis of heat, and electro-chemistry came into the world about the same time. Then there is organic chemistry, originating about forty years ago, in Pasteur’s researches into the phenomena of fermentation.

The law of Avogadro is the foundation of modern chemistry. J. P. Cooke, in *The New Chemistry*, remarks of it: "It holds the same place in chemistry that the law of gravitation does in astronomy." Ad. Wurtz, in *The Atomic Theory*, writes of it: "In fact, we may say that the other physical and chemical laws of which we have spoken . . . do not rest upon such a number of imposing facts, and, consequently, upon such a solid foundation, as the law of Avogadro." This law tells us: Equal volumes of gases under the same conditions of pressure and of temperature contain the same number of molecules. It is evident that this statement implies that differences in weight between gases must be accounted for, not on the assumption of different numbers of molecules in equal volumes of different gases, but on the assumption of different weights of molecules. Then, assuming it could be shown that two equal volumes of different gases, under the same external conditions, contained, not only equal numbers of molecules, but also of atoms, and yet differed in weight, it is obvious that the atoms as well as the molecules of the two gases must differ in weight. This is just what chemists tell us is a common occurrence. Thus, to instance only two cases of recent interest, the latest discovered elements, argon and helium, are monatomic—that is, their molecules are each equivalent to but one atom. As these gases differ materially in weight, their atoms, consequently, must likewise differ. Thus, it is evident that Avogadro's law directly conflicts with the basal assumption

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of Maxwellian physics—that atoms are identical units of mass.

Again, what is called the chemical hypothesis of valency tries to account for chemical interactions involving transmutation of matter by attributing to atoms inherent predispositions to certain forms of combination. Thus Wurtz writes: “While one atom of potassium unites with one atom of chlorine to form a chloride, an atom of lead takes two atoms of chlorine, and an atom of antimony three or even five. This difference in the power possessed by simple bodies of forming more or less complex combinations with another simple body must be considered as a peculiar property, inherent in their ultimate particles, and in order to distinguish it from affinity, which implies the *force* of combination, it has been termed *atomicity*, which is synonymous with combining *value* or *valency of atoms*.” It will be seen how utterly irreconcilable is such a statement as the foregoing with the old physical concept of mass-inertia. How can the old mechanical axioms be applied to such atoms? Yet chemists themselves, with that perverse submissiveness to custom so characteristic of humanity, are now throwing themselves into the arms of this exploded mechanics by trying to interpret phenomena of atomic selection in terms of mere mass and motion.

Thus the chemical and “kinetic” hypotheses of atoms are irreconcilable with the mechanical atomic conception of classical physics. The latter involves that atoms are ultimate units of mass, absolutely homogeneous. The “kinetic” and chemical hypo-

theses involve that atoms are *not* homogeneous. As shown, this is involved because the "kinetic" and chemical hypotheses necessitate that the ultimate particles of gases shall be elastic, and some of these particles cannot be other than the atoms of chemistry and physics. But these divergencies from the classical conception of atoms are not exhaustive of the differences between chemistry and physics. Even the "kinetic" notion of atoms is irreconcilable with the chemical notion of atoms. The ultimate unit of kinematical physics, while differing, through its non-homogeneity, from the old "atom," is still not analogous to the chemical conception either of an atom or of a molecule. The "kinetic" atom (called a molecule), according to Maxwell, "unalterable by the processes which go on in the present state of things, and every individual of the same species is of exactly the same magnitude, as though they had all been cast in the same mould, like bullets, and not merely selected and grouped according to their size, like small shot," will not at all fit in with the chemical notion of molecules. These are continuously altered in every process of chemical change. Or will it fit in with the chemical notion of atoms? These are continuously entering into fresh combinations to form new chemical molecules, which chemical molecules can sometimes be none other than the equivalents of Maxwell's molecules.

Obviously, chemical molecular transformations, according to the atomic theory, being based on rearrangements of atoms, cannot be accounted for on the assumption of atoms (Maxwell's molecules) which

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are "unalterable by the processes which go on in the present state of things."

Again, according to the kinetic theory of gases, it is necessary that the whole translatory motions of the particles shall be preserved as such, that is, that these motions shall not be transformed into internal (intramolecular) motion, or heat. But if the gaseous particles are composed of still smaller moving particles, producing the intramolecular heat, as postulated by thermodynamics, it is evident that gaseous molecules, instead of preserving their rectilinear motivity, would soon lose it, as heat. Hence, the kinetic theory has to assume that gaseous molecules are absolutely homogeneous, as stated in the above quotation from Maxwell, and thus incapable of losing their translatory motions, as intramolecular heat. So they become practically the atoms of mechanical physics. However, the kinetic theory requires them to be perfectly elastic, hence, as already shown, they cannot be homogeneous. Accordingly, it will be seen that the kinetic theory, besides being irreconcilable with chemistry and mechanical physics, contradicts itself, inasmuch as it requires the particles to be at once perfectly rigid and perfectly elastic.

The conception of a "perfect" fluid ether, as shown, is inherently self-contradictory. After its adoption as accounting for certain assumed phenomena of light, physicists found that, even for that purpose, it was inadequate, as it would not account for dispersion, or what is assumed to be the fact of

unequal velocities of light waves, as shown in spectra. The analogy between light and sound is well known. Pitch varies according to assumed differences in sound-waves. Colour varies according to similar assumed differences in light-waves. But we find that all sound-waves travel through a continuous medium with the same velocity. Were it otherwise, music heard at a distance would become chaotic. Then, why should light-waves be assumed to travel at different speeds? Astronomy does not support the assumption. This is shown by the appearance of satellitic light after eclipse. Observation has failed to detect any difference from normal white light in the rays appearing under such conditions. In the case of Jupiter, at certain periods, over forty-nine minutes must elapse, according to current hypotheses regarding "light," before his light can reach the earth, yet nothing abnormal has been discovered in the light of his satellites at the moment of their emergence from eclipse. Some pretend to overcome this difficulty by positing that light rays are propagated with equal velocity in the free ether, but that in ether within refracting substances the equality is annulled. Such an assumption is manifestly an arbitrary fiction to meet the difficulties of an hypothesis. There is nothing to warrant it beyond the fact that phenomena of dispersion, according to the undulatory hypothesis, require the assumption of unequal retardation in refracting media. The fact, above indicated, of equality between sound-waves, however transmitted, and the astronomical demonstration

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regarding light from Jupiter, seem to me fatal to the assumption of unequal luminar retardation, whatever be the medium. However, even granting the particular retardation, physicists find that a continuous fluid ether will not account for the assumed facts which they are now trying to interpret on the assumption of a discrete atomic ether. This, of course, is virtually an ordinary gas with smaller particles, and involves all the difficulties of the kinetic theory, as being irreconcilable with mechanical physics, which, according to its founder, Sir Isaac Newton, is based on the fundamental conceptions that the only force which inheres in matter is inertia (*vis inertiae*), and that extraneously imposed force (*vis impressa*) never becomes inherent force, or *vis insita*.

Both rigid and elastic atoms being found inadequate for their purpose, physicists, as already indicated, have invented to supersede Maxwell's "bullets," as the basis of a kinetic theory, various forms of atoms which they call vortex. By mathematical processes which are significant of the fecundity of their imaginative powers, physicists seem sanguine that these vortex-atoms are going to crack the "nut" of the universe. Professor Hicks tells us, in his address at the British Association meeting (1895) that "there are two ways of dealing with a difficulty occurring in a general theory—one is to give up the theory, the other is to try and see if it can be modified to get over the difficulty." There is no doubt about the perseverance of the "vortex" advocates in the latter direction, and there seems to me no doubt that

it will not enable them to "get over the difficulty" which is to demonstrate that a perfectly homogeneous, all-pervading, inert fluid can differentiate itself into the centres of motion called vortex-atoms. Though I am told that a certain learned professor has "published his beautiful discovery of the existence of a spherical vortex," I am so stolidly sceptical as to assert that that "spherical vortex" only exists in his own spherical mathematical vortex. He might as well tell me that he has discovered a "spherical motion" in an absolute void as a "spherical vortex" in such a fluid. In fact, were he to tell me that his mathematical researches had enabled him to "discover" that a beef-steak could differentiate itself into a mutton-chop, I should be no more sceptical about the "discovery." Indeed, physicists themselves are now finding insuperable difficulties in the way of the vortex-hypothesis as accounting for physical atoms. Thus, a leading opponent writes: "Helmholtz made the great discovery that by virtue of their vorticity vortex rings floating in a perfect fluid are unable to destroy or create one another, although these vortices may distort each other; becoming drawn out into thin threads or rolled into spherical balls, one cannot destroy another. This discovery it was that afforded a basis for those speculations of Lord Kelvin which would identify atoms with vortex rings moving in a perfect fluid; the indestructibility of atoms finds a parallel in the permanency of vortex rings, and the two have many properties in common. As, however, our knowledge of vortices has increased,

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so obstacles to the acceptance of the atomic vortex hypothesis have arisen. . . . It is therefore impossible to believe that atoms are simply thin vortices floating in an otherwise motionless and structureless medium.” Again : “The vortex theory of atoms and the experimental facts regarding atoms are thus sadly at variance.”

Physicists see that the vortex hypothesis is dead against the accepted “kinetic” axiom that the translation velocity of gaseous particles increases with increase of temperature. According to the vortex hypothesis, gaseous particles, instead of increasing their kinetic energy with increase of temperature, decrease that energy, thus involving that, under the conditions, more energy leaves the gas than enters it. The “vortex” advocates at once meet this objection by nonchalantly kicking away the “kinetic theory.” They ask, to quote a leading advocate : “Why should not velocity fall off? The velocity of gaseous molecules has never been directly observed, nor has it been experimentally proved that it increases with rise of temperature. We have no right to import ideas based on the kinetic theory of hard discrete atoms into the totally distinct theory of mobile atoms in continuity with the medium surrounding them. Doubtless the molecules of a gas effuse through a small orifice more quickly as the temperature rises, but it is natural to suppose that a vortex ring would do the same as its energy increases.” To establish the above proposition, this authority then proceeds to trace the conceptual life-history of this conceptual

entity, or vortex-atom. In accomplishing his purpose the eminent mathematician attributes to the vortex a developmental manifestation quite analogous to that attributed to cells by the biologist. The directive faculty, to which I have already alluded, as essential to the biological factor, is now attributed by the physicist to his vortex-atom. Still, he resolutely tries to ignore this fundamental determinism, flattering himself that, by mathematical mechanics alone, he can account for the atomic manifestations. This is as though I were to "explain" the phenomenon of raising my hand by the law of the parallelogram of forces. However, if, as a "vorticist," I advance the analogous "explanation" *re* atoms, I render the "explanation" additionally futile, inasmuch as I apply it to a mere conceptual product divorced from sense-experience.

Another remarkable "fact" postulated by the vortex hypothesis is that mass, involving weight, varies with temperature. This, of course, makes a clean swoop of the well-seasoned mechanical axiom of the indestructibility of mass, which indestructibility is empirically "proved" by the assumed persistence of its weight under all phenomenal contingencies, and is empirically *disproved* by the pendulum experiment. The vortex theory supports the contention that the pendulum experiment demonstrates the destructibility of mass.

Thus proceeds this interminable repudiation of doctrines by eminent physicists. No sooner is the "kinetic" theory trumpeted forth as *the* explanation

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of atomic manifestations than the "trumpets" are incontinently plugged by rival theorists. Well may we observe, with the eminent "vorticist" above quoted: "By our imagination, experience, intuition, we form theories; we deduce the consequences of these theories on phenomena which come within the range of our senses"—and, I venture to interpolate, on those which do not come within their range—"and reject or modify, and try again. It is a slow and laborious process. The wreckage of rejected theories is appalling." This "appalling" result, from my standpoint, mainly ensues because eminent physicists are now trying to supersede the method of empiricism by the method of imagination. They are becoming artists instead of remaining scientists. The vagaries of pure intellectualism lead them into the realm of fantasy.

Motive manifestations are amenable to mathematical treatment, but only so long as they are phenomena of sensuously perceived objects. Applied to the supersensuous to explain *formative* phenomena, whether these come under the chemical, or biological, category, mathematical treatment simply offers us another bogus "authority," in place of that of theology. The tendency of modern science, as exemplified in such an hypothesis as that involving vortex-atoms, filaments, cells, and so forth, is to supersede the old mechanical conception of matter, as being ultimately hard and impenetrable, by an assumption that the ultimates of matter are mere "centres of energy." This practically relegates

“matter” to the realm of “spirits,” sweeping away all our conventional notions on the subject. To talk about the impenetrability of matter, in the old mechanical sense, is, according to the new hypothesis, out of the question. The “perfect fluid” which differentiates itself into “centres of force,” whether called vortex-atoms or any other fancy name, can manifestly have no analogy to the old concept of matter.

CHAPTER VI

ENERGIES

FROM my standpoint our conventional notions of time, space, motion, matter represent no absolute realities. It may be asked : Is not this tantamount to a repudiation of all current science ? I reply : It is tantamount to a repudiation of all so-called science which seeks to sensualise the insensible. It is an explicit protest against the pretensions of physical investigators who practically adopt the *rôle* of ontologists by advancing the products of their imagination as definitions of absolute reality. It may be urged that physicists take care to disclaim any such pretensions : that they merely advance their definitions of the insensible, as speculation.

I reply : Whatever a few physicists, individually, may disclaim, they collectively lead the public to suppose that what they advance regarding atoms, ethers, and cognate products of imagination is rationally acceptable as inference from sensory experience. The inevitable tendency of their methods of thrusting forward their conceptions is to drive the

public towards conclusions adverse to ethical and religious evolution. I maintain that, if we are rationally bound to repudiate the products of theological imagination as being adverse to social honesty, we are equally bound to repudiate, except as formal hypotheses, other products of imagination advanced by physicists. Under certain conditions they are both equally noxious factors. To obviate the necessity of what they call supernatural interference, physicists practically exemplify the same method as that employed by theologians to demonstrate that interference. The theologian's method, through its vain pretensions to define Deity and present religious belief on the basis of rationally annihilated tradition, renders religion ridiculous. Similarly, the physicist's method, through its vain pretensions to define the insensible, renders science philosophically ridiculous.

The definition, as entities, of light and sound, as "wave-motions," shows that the concepts are merely cerebral phantoms divorced from sensory experience. To talk of wave, or any other sort of motion, as independent of a moving object, is a spurious metaphysical statement, the words of which, to human apprehension, can have no thing-significance, yet are used as defining things. When physicists apply mathematical processes to such fanciful products, the issue is merely a manifestation of a cycle of normal cerebral interactions involving processes which may be roughly considered analogous to those effecting, say, gastric transmutations. The mental pabulum,

however, unlike the stomach's, is evolved by the organ itself. Then, the brain treats this self-evolved product as though it were extraneously imposed. Whatever the brain achieves by this process, I shall show, does not involve inference from sense-experience, and can only have significance as showing that normal cerebral activity, exercised in a definite direction, involves certain constant results. In respect to objective reality, these have no more essential validity than the fancies, say, of poets; in fact, I should say, they have less, poetry being essentially an outcome of sensuous responsiveness. We might just as well deal mathematically with the properties of love and hate, as objective entities, as with that of light considered as "wave-motion." It may be urged that light, after it is millions of miles away from the sun, produces a multitude of effects which we can readily determine, therefore it must be something in itself. I reply that all we do when we determine these effects is not to identify light as an entity, but to respond directly or indirectly through other matter-systems, to the sun. Our fellow matter-systems—organic and inorganic—respond in their own fashions, as we do in ours, and when we examine the way those systems respond to "light" we simply respond to the sun by deputy. The sun likewise responds to us by deputy, say, through the earth. The earth, again, responds to us and the sun. Thus, through the cosmos, this process of reciprocal response constitutes phenomena, and binds together the cosmical constituents, constituting the cosmos an organism.

Transparency, opacity, refrangibility, polarisation—all such terms, as conventionally applied, represent no objective realities. They merely represent arbitrary transposition from the real to the imaginary. The case was somewhat different with our ancestors. They believed heat, for instance, to be a material substance. That was a logical inference from their mechanical physics. Hence, they could treat heat as an independent entity, and had no need to cudgel their brains to devise ethers for its transmission. We, on the other hand, believe we know that heat is not matter. Still, though we have discarded the old fiction that heat is a substance, we have invented, against the logic of our mechanics, a multitude of eccentric notions, which we designate ethers, to account for its transmission as an entity which needs conveying as though it were matter. In all such symbolical applications as those involved in the above terms, the real is ignored for the unreal. The inherent energy, or soul, of matter-systems, which is the “real thing,” becomes obscured so soon as we attempt to isolate the manifestation from its substratum. Whether we attempt this in regard, say, to organic pain or to inorganic radiation is equally futile procedure. It is on all fours with the old metaphysical procedure dealing with mind as an entity apart from brain. In the light of present knowledge the physical is no more rational than is the metaphysical procedure—in fact, the one is essentially the other. Because, say, a certain matter-system which we call a glass prism, or one

of Iceland spar, in responding to another system, which we call, say, the sun, produces on still another system, called a screen, certain effects, and this screen, as a responding system, produces on us, as other responding systems, certain effects which we assume to represent special ultimate conditions of the response of all the other systems to the sun, we "incarnate" our special response as though it was the only one, out of a vast series of interactions, which had objective significance. We argue, on the basis of this isolated manifestation of our own, as though it alone represented the *ens* involved in a phenomenal cycle, all the series of which are inherently interdependent. We might just as logically pretend to isolate, say, toothache, and scrutinise it by mathematics. The philosophical absurdity of such procedure is manifest when we consider such a discovery as that recently made by Professor Röntgen. He finds that certain substances, such as flesh, skin, blood, wood, conventionally considered opaque, are permeable by certain "luminous radiations" issuing from an electrified glass vacuum tube. Thus, bones can be "radiographed" through flesh, the latter responding to the luminous rays, as does glass to light; or objects can be "radiographed" through the sides of a wooden box, and so on. On the basis of such facts, physicists at once say this cannot be a phenomenon of light. The entity must be some other form of radiation. Still, I reply, the responses of the photographic paper and other media are essentially the same as though it were light. The

picture is there, intact, much as in an ordinary photograph. Then, why is the radiation from electrified particles streaming from the negative pole of a Crookes's tube not light? One reason given by physicists is that it is not "refracted." A prism will not cause the rays to diverge, or will the lens cause them to converge to a focus. I maintain that the difference arises, not from any difference in "radiant energy," as an entity, but from the different responses between matter-systems under different conditions of excitation. The "thing itself" is not the "radiation," but the responding systems which manifest different effects, according to their environment. When a man manifests two responses, say, rage and gaiety, we do not try scientifically to differentiate, as entities, his manifestations. We look solely to the man himself as the *ens*. Similarly, I maintain that, in contemplating the "radiations," instead of the "radiators," as the real factors, we are putting the cart before the horse. That the "X" radiation (of Röntgen's experiments) is not refrangible by glass; that very clear glass is nearly opaque to it, while ground glass is less so; that such substances as ebonite, carbon, india-rubber, copper, iron, aluminium are in various degrees transparent to it, is no real reason for differentiating, as entities, the particular forms of interactions.

That we cannot "see" through wood, flesh, etc., but that we can "see" through glass, does not involve that a thing, or *ens*, penetrates glass, but cannot penetrate wood or flesh. It merely involves that

a particular correlation of "atoms" (called a visible object) acting on us through the intermediation of another correlation (called a transparent object) affects us differently from a correlation of "atoms" (called an invisible object) acting on us through another correlation (called an opaque object). In any case, the particular effect does not involve any question regarding the identity, as a *thing*, of any particular interaction. It merely involves an interchange of manifestations of inherent potentialities by a number of matter-systems each exhibiting a specific idiosyncrasy. That we see an object through a sheet of glass, but fail to see it through a wooden board, involves that our visual response to the glass gives us an impression different from that issuing from our visual response to the board. Again, it involves that the response of the board to the object behind it, so far as concerns effect on ourselves, is different from the response of the glass to that object. However, these effects on ourselves cannot be rationally accepted as evidencing an *ens* apart from the matter-systems. Assuming our visual perceptivity were so constituted that the so-called "X" rays were also those causing our correlations of nervous matter to afford us the sensation of sight, then clear glass would become, so far as we were concerned, the opaque, and the board, the transparent system, and the "X" rays would become our "light." Still the fundamental conditions would not be altered. All the issues would depend on responding systems, not on "energies" as the real factors, or *things*.

In considering such questions as the above, we must clearly recognise that the response of the glass or wood to *its* "object of perceptivity" is just as real as our own, and that when we respond, by seeing for instance, to one object through another, we get, through the transparent object, its own "version" of the character of the object we perceive through it. When our visual perceptivity, without the intervention of such a transparent object, of another object, conforms with our visual perceptivity, subject to such intervention, then we must acknowledge that our responsive idiosyncrasy conforms with that of the transparent object. When, on the other hand, through some peculiarity of structure, a transparent object affords us an abnormal (in respect to ourselves) visual perception of another object, or when an opaque object affords us no visual perception at all, we must conclude that our perceptivity differs from the "perceptivities" of those objects. Still, our perceptivity is no more valid than are the others, to determine reality. On the other hand, our form of response called seeing is no less real, as an entity, than is the form of response, say, of an incandescent system such as the sun, which we call light. Again, both forms of response, as entities, are equally inseparable from their originating matter-systems. Consequently, there is no more reason in applying mathematics to determine the sun's radiation than to determine our seeing. The manifestations in both cases cannot be dealt with as *things*, but merely as the interactions of things. All we do in applying

mathematics to the sun's manifestation, light, is to follow out a logical process, in regard to an imagined sense-experience which we confound with a real one.

Reverting to our example, the object we see through the glass is the product of the response of the glass to that object, and as our normal response, through the intermediation of the atmosphere, is the same as through the glass, we must assume that the reaction of the glass particles and that of the air particles conveying to our brain the sensation of vision are analogous. Of course, the *sensation* we derive is a totally distinct matter from this analogy of response between us and the air and glass. However, it does not affect the point at issue.

Apart from our own idiosyncratic responses to the glass and wood, we have no means to decide whether there is any essential difference between the responses of these to the object behind them. All we can posit, as objective truth, is that the responses between glass, a certain object and ourselves, and between wood and that object and ourselves, involve different experiences to us. Again, when we come to express our perceptions of the effect of another matter-system, say, the sun, on the glass and wood, by stating that the glass is transparent, the wood opaque, to light, we merely "incarnate" in the term light a product of our own imagination. Our scientific, like our theological, anthropomorphism leads us into sad quagmires of misapprehension. There is no such *thing* as an excitant apart from its substratum. All

experiential difference, whether of organic or inorganic systems (the latter, of course, experiencing, in their way, as truly as do the former), arises solely from, and depends solely on, innate predispositions impressed by God.

When we apply mathematics to light, or any other "energy," we really apply it to idiosyncratic manifestations of ourselves. But, unlike other such idiosyncratic manifestations, light is an abstract assumption outside sense. We cannot see, hear, touch, taste, smell light in the sense that we can apply the various senses to a concrete matter-system. We can only imagine there is such a thing as light through abstracting from our sensory apprehension of concrete objects, just as we so abstract, say, the sensation of physical pain. Take away the concrete stimulus, there is neither light nor pain. If physicists dealt with light as they deal with pain, I should have nothing adverse to say. I only demur to the physicist's dealing with light as he does not deal with pain, and postulating, through his arbitrary procedure, that light is an entity equivalent to an object of sensory apprehension and essentially different from pain. From my standpoint there is no warrant for so dealing, as definable reality, with any experience that we cannot identify through the senses. Corollarily there is no warrant for applying abstract forms, such as mathematical, to any experience not involving such sensorially apprehended *ens*.

So soon as we apply mathematical *formulæ* to

light, we merely apply one abstract process to another, and the application is of no more service as revealing truth that is not a mere closed circuit of ratiocination than is pure mathematics itself. What we then do is not to deal with light as part of the body of collective experience logically arising from sense-experience, but to try to imagine it as an abstraction conformable with another abstraction—mathematical. We then merely deal with light as the grammarian deals with words. This mathematical is totally distinct procedure from the inferential empiricism of chemistry, biology, and physiology; it involves a spurious form of metaphysic postulating the objective on the sole warrant of intellectual abstraction. Granted its premises, such procedure can, of course, prove anything, just as can Euclidean geometry, or formal logic, on like conditions. But, while we do not apply Euclid or formal logic to establishing a self-existent universe, some of us apply the mathematical metaphysic to that end.

In *Nature* of November 19, 1896, there is an interesting abridged account of a lecture delivered before the Franklin Institute, by Professor A. E. Dolbear. The lecture is entitled, "Mechanical Conceptions of Electrical Phenomena." The lecturer attacks current notions regarding the forms of sensation (or, according to his view, forms of motion) which we call light and electricity.

According to current hypothesis, light and electricity are entities, to the extent that they are virtually the same things when in the ether, as when

in nervous molecules and ordinary matter-molecules. Professor Dolbear rejects these notions. He maintains that light and electricity are simply different forms of atomic motions, and that inasmuch as the ether is essentially distinct from matter, there is nothing occurring in the ether during the phenomena of luminar and electrical transmission between matter-systems warranting the assumption that light or electricity exists as an entity in the ether.

In matter, light and electricity, according to Professor Dolbear, are different forms of atomic motions. He apparently considers atoms, molecules, ether, as, themselves, objective realities, just as he considers, say, a brick objectively real.

As to the ether, Professor Dolbear says: "Here is a substance which, *experimentally*" (*italics mine*) "shows itself to be illimitable, continuous, homogeneous, isotropic, non-atomic, frictionless, incompressible, incapable of transforming its own energy, gravitationless, and insensible to all nerves." Now, let us turn to ordinary matter. This is "limited, discontinuous, heterogeneous, eolotropic, atomic, frictionable, compressible, capable of transforming energy, gravitative, and upon which all nerve action depends."

What Professor Dolbear means by "experimentally" verifying his ether, is that he verifies it by certain inferences from other inferences regarding the character of certain "atomic motions" which he calls light, electricity, magnetism. These atoms and their motions are, themselves, purely conceptual products of

mathematical abstraction. Accordingly, to talk of ether as a "substance which experimentally shows," etc., is apt to mislead people whose notions of "experiment" limit its possible scope to objects of sensory experience.

Professor Dolbear shows that all forms of electrical phenomena, mechanical, thermal, magnetic, chemical, physiological, are products of one variable factor; motion into mass, constituting "molecular motion." Heat and light are other combinations of the variable motion with mass. As I have shown, "motion" and "mass," as separate entities, are purely conceptual. Therefore, to deal with one or the other, as a separate variable, involves metaphysics not bound to sensory experience. Premising this, let us grant that electricity, light, heat are molecular motions. Applying these conceptions to the ether, it is obvious that light, heat, electricity, as molecular phenomena, cannot be phenomena of the ether, that mystical non-atomic product, "illimitable, continuous, homogeneous," and so on, according to the definition given above. Thus, there can be no heat, light, electricity in the ether. As Professor Dolbear remarks: "A vacuum is a perfect non-conductor of electricity. Is there more than one possible interpretation to this, namely, that electricity is fundamentally a molecular and atomic phenomenon, and, in the absence of molecules, cannot exist? . . . The heat of the sun in some way gets to the earth, but what takes place in the ether is not heat conduction. There is no heat in space, and no one is at

liberty to say, or to think, that there can be heat in the absence of matter."

Now, as there can be no light, heat, electricity in the metaphysical ether ; as light, heat, electricity are products of a metaphysical variable motion, into another metaphysical variable mass, I want to know why I shall not altogether scout light and electricity as having any existence, except as interaction between what we sensorially perceive as air and concrete bodies, logically elaborated to units of stimulus and consciousness (to be later discussed in detail), and ourselves as such units. If electricity and light, as Professor Dolbear tells us, are "fundamentally molecular and atomic phenomena," and as atoms and molecules, in the physicist's sense, are purely imaginary, what is the use, philosophically, of dealing with light and electricity as anything else than the mutual interactions of units of stimulus and consciousness (spiritual objectives), no more existing outside the units than my brain exists outside my skull ? Of what significance, except as the truth of *a priori* conceptualism, is mathematical exercitation regarding these "energies" ?

Let us consider a quotation from Sir Isaac Newton's communication to the Royal Society, 1672. This offers a concise statement apparently proving the objective reality of light, and runs as follows : "The species of colour, and degrees of Refrangibility proper to any particular sort of Rays, is not mutable by Refraction, nor by Reflection from natural bodies, nor by any other cause that I could yet observe. When any one sort of Rays hath been well parted from those

of other kinds, it hath afterwards obstinately retained its colour, notwithstanding my utmost endeavours to change it. I have refracted it with prismes, and reflected with Bodies, which in Day-light were of other colours ; I have intercepted it with the coloured film of Air interceding two compressed plates of glass ; transmitted it through coloured Mediums, and through Mediums irradiated with other sorts of Rays, and diversely terminated it ; and yet could never produce any new colour out of it. It would by contracting or dilating become more brisk, or faint, and by the loss of many Rays, in some cases very obscure and dark ; but I could never see it changed *in specie*."

The above implies that something is objectively real that we cannot perceive by any of our senses. It may be urged, we perceive the one ray parted from the others. I say, we do not, except as an imaginary percept, or as a conceived abstraction, as, say, the term "magnitude." We do not see a "ray of light," any more than we see a "magnitude" apart from an object of sense. When we "see" the "ray," all we do is to interact with certain bodies which, again, interact with one another. These bodies we apprehend as true objectives, by our senses. But, it may be asked, how will this proposition accord with the fact that the particular "ray" maintains its integrity, whatever be the body interposed ? I reply, all these bodies similarly interact with us and with one another, in regard to the originating source of the "ray." In other words, the unit, or units, of stimulus constituting the "ray," emanating from its immediate source,

arouse corresponding units of consciousness (analogues, in "matter," of our sense-reactions) in the intermediate bodies, which, again, affect us as units of stimulus perceived by us as corresponding units of consciousness (sense-impressions). The "ray" is never changed, as put by Newton, *in specie*, because the interactions of the various bodies and ourselves are not changed *in specie*.

We can infer *definable* objective existence (to be later discussed in detail) for what we can sense (not, however, *as* sensed), but not for what we cannot sense. We can sense the bodies as qualities, and we can infer actions on ourselves by those bodies ; but we cannot sense the "ray," any more than we can sense the number 2 apart from bodies. Of course, if we like to imagine any constant product of interaction as being a thing in itself, we may apply mathematics, or any other scrutiny to it, but we shall not thereby demonstrate objective reality. It may again be urged ; this isolated "ray" preserves its identity no matter what other sorts of "rays" mingle with it. Does not this, it may be asked, show objective reality ? I say, no ; it merely shows the persistence of an interaction. So long as the particular interaction persists, the "ray" persists. Until the particular interaction, as what we call refraction, arises, the "ray" does not exist, just as, until the particular interaction we call white light arises, a multitude of commingled "rays" do not exist.

The only really objective existence, beyond ourselves, involving perception for us, of "light," are

the units of stimulus (ultimate spiritual "substratum") constituting the sun or some other matter-system manifesting what we call combustion, phosphorescence, etc. Why, it may be asked, are these "units" more truly objective than is "light"? I reply: Because the units, as inference, have, as I shall later show, an intellectual pedigree reaching to sensory empiricism, while "light" has no such pedigree. Still, it may be urged, the units are as much conceptual as is "light." Granted. But the units are the logical ultimate of collective experience based on empiricism, while "light," as a defined entity, is merely an assumption based on fanciful externalisation.—a product of imagination. We cannot logically show that light constitutes anything we can sense, whereas, as I hope I have demonstrated in this work, we can show that what we do sense, as bodies, must be ultimately something we may generalise as units of stimulus and consciousness. Granted that these units are no more sensorially perceptible than is light; still, they emanate logically from what is sensorially perceptible. They are not defined assumptions based on "nothing," but are ultimate inferences projected outside definition, from the only "something" of which we have first-hand knowledge.

It may be asked, what about Marconi's demonstration of electric communication between England and France?—surely, it may be urged, this affords sensory demonstration that electricity is a real entity! I reply, it affords no such demonstration, but is merely another illustration of that for which I contend: that electricity

—like 'light and "energies" in general—is, as an entity, a phantom of the imagination. The only real entities concerned, so far as regards phenomenal empiricism, in Marconi's demonstrations are interacting matter-systems—the "electrical" appliances, the atmosphere, earth, sun. These mutually respond as do my nervous system and a knife when I cut myself with it. The pain I experience is equivalent to the response, say, of the sensitive powders in the receiving-apparatus. The "message" from the knife affords me pain. The message from the sparking poles of Marconi's transmitter affords the air and the powders certain "experiences" causing the powders to manifest, as our response to them, "changing moments of rest," or what we call motion, which, again, affords "experiences," as "motion," to other parts of the receiving apparatus ending, say, in the Morse recording appliance. All here concerned is interaction. Nothing is transmitted between the stations but "emotions," or "sensations" of matter. We may just as truly say that an entity—call it energy, force, or what you like—apart from the knife and my nervous system, is concerned in the resulting pain, as say that such an entity is concerned in the various effects of wireless telegraphy.

When I state that grass is green, I state a fact of sensuous experience. When I state that certain minute components of grass, which I call chlorophyll granules, cause the green colour, I state a fact of observation. When I state that they cause the colour by absorbing certain supposititious "rays" coming

to the granules through another supposititious entity called ether, I state nothing but conjecture, because I have no sensuous perceptivity enabling me to observe the "rays," or the "ether," and no sensory basis for inference. When I assume I see the "rays" in a spectrum, I do not perceive them, *as entities*, in the sense that I perceive the grass. I perceive them as my counter-response to another matter-system, which itself "perceived" them as its own counter-response to another matter-system, and so on, indefinitely. The "ether" and the "rays," as entities, are, in this connection, mere figments of imagination, which we may reject or accept, according to our stage of intoxication by the particular conceptual system which has evolved them. They are merely parts of a system of mathematical dialectics, having no more real connection with the supersensuous phenomena to which they are applied than has a discussion about prepositions.

Suppose we interpose an upright screen, perforated by a small aperture, between a lighted candle and another upright screen, suitably adjusting the distances. We shall perceive, on the latter screen, an image of the candle. The current physical hypothesis regarding the phenomenon is that light-rays proceed, in every direction, rectilinearly, from every point of the candle, but, as the middle screen intercepts all the rays except such as can pass through the hole, only these latter can reach the back screen. Hence, every part of the candle sending a small fasciculus of light through the hole, produces, on the back

screen, the image of the candle. But there is another point to consider. This image is inverted. The top of the candle becomes, in the image, the bottom. Why should this occur? Physicists tell us that the inversion occurs because light-rays, being propagated rectilinearly in all directions, must cross at certain distances away from their points of origin. From my standpoint, they tell us this merely because they have formulated an hypothesis requiring the assumption, and which hypothesis is based on their liking for geometrical visualisation.

Let us now consider another case. According to physicists, a geometrical shadow represents the light-rays obstructed by an opaque body. There are two sorts of geometrical shadows, one issuing from an opaque body, when the source of light is a "point"; the other issuing from an opaque body illuminated by a light-yielding body of sensible dimensions. In the first case, there issues only one shadow; in the second, two, one being then called the shadow, the other the penumbra. I need only now consider the geometrical shadow. This is another "perfect" invention of physicists. In reality, we never perceive such a shadow. This "perfect" shadow is theoretically demonstrated by the fact that straight lines drawn from the hypothetical luminous "point," so as to impinge on the opaque body, define the shadow. This is considered evidence that light is propagated rectilinearly. I do not see that it is evidence of anything, except geometrical visualisation and conception.

Assuming that some entity, light, proceeds through

another entity, ether, and that the former entity cannot penetrate an opaque body, then, of course, we may assert, as a matter of subjective experience, that the shadow represents no-light. Still, it is hard to understand, if ether indifferently penetrates all bodies and carries light millions of miles, why light should not also penetrate all bodies indifferently, rendering all transparent. We should naturally suppose, that an ether which could penetrate all bodies and carry light millions of miles would not be baffled by, say, a quarter of an inch of cardboard. However, so it is, according to physicists ; that quarter of an inch of cardboard is the "last straw" (excuse the Rochism) which breaks the back of the all-pervading ether, undoing all those millions of miles of work by the "all-pervading." When we inquire why this remarkable effect is assumed to occur, we must accept the answer ; because we only see through bodies that allow light to penetrate them, and, as we cannot see through the quarter of an inch of cardboard, light cannot pass through it. That this conclusion is based on a series of arbitrary assumptions, I think the reader will now be prepared to admit—at any rate, as what physicists call a working hypothesis. I think the reader will grant that our seeing and geometrical proclivities do not constitute a very stable foundation on which to erect a real interpretation of light.

It may be urged that Roemer's calculations for the eclipses of Jupiter's moons determining the event (when Jupiter was in conjunction with the sun) as 16 m. 36 secs. too soon for the actual occurrence,

show that light is an entity travelling at the rate of about 186,300 miles in a second of time; the difference between the calculated event and its actual occurrence arising from the fact that light, under the conditions, has to travel the extra distance of the earth's orbit to reach us. I reply that this opens up the question of the objective reality of "space," to which I shall later give consideration. Of course, assuming the statement that the earth's orbit round the sun is 186,000,000 miles represents some sensed reality (space), it requires but a simple arithmetical calculation to show that the difference between the calculated and actual events involves the stated velocity for light assuming such an entity. Again, as this conclusion regarding the earth's orbit issues through the same mathematical and visual idiosyncrasy which affords us the undulatory hypothesis, it is not surprising that calculations regarding the orbit agree with calculations regarding light, and that empirical investigators, such as Fizeau, Foucault, Cornu, Newcomb, who have experimentally determined the velocity of light, as an entity, approximately agree with an astronomer who has determined it mathematically. Our visual (sensory) and mathematical (intellectual) perceptivities being conditioned as a symmetrical correlation of nervous interactions, the two perceptivities, when normally exercised, must necessarily correspond, as mental sensation. The question is, not this correspondence, but does the correspondence involve real, or merely formal, explanation? I maintain that it involves merely the latter. It merely demonstrates

a normal series of cerebral interactions, and has no validity to decide the objective existence of light, as anything beyond a product of interactions between emissive and recipient matter-systems. Accordingly, all such talk as we commonly hear about our seeing this or that heavenly body by light which left it hundreds or thousands of years ago has no rational significance as real presentment. It involves nothing more than deduction from abstraction exemplifying a normal cycle of cerebration.

I may here quote a significant utterance by Lord Kelvin, on the occasion of the celebration of his professorial jubilee. It would be advantageous if the public heard more of this sort of avowal than is vouchsafed by eminent physicists. Lord Kelvin said : " One word characterises the result of the most strenuous of the efforts for the advancement of science that I have made perseveringly during fifty-five years. That word is failure. I know no more of electric and magnetic force, of the relation between ether, electricity, and ponderable matter, or of chemical affinity, than I knew and tried to teach to my students of natural philosophy fifty years ago, in my first session as professor."

What physicists call the indestructibility of matter and the conservation of energy really represent the indestructibility and conservation of the subjective illusions of physicists. Their "energy" and "matter" are products of their own circumscribed interaction with factors, some of which they mentally experience, as units of stimulus and consciousness ; others of

which are entirely outside the mental ken of physicists. For instance, physicists tell us that, if we carry a stone into our attic, holding the stone outside the window, the stone is, in some respects, different from itself when lying on the ground. Physicists tell us that, by carrying the stone to the top of the house and poising the stone outside the attic window, we have endowed the stone with a quality it did not possess when lying on the ground. This new constituent of the stone, physicists call potential energy or energy of position. They tell us that, when we drop the stone, it loses this "potential" energy, expending it as what they call "kinetic" energy. When the stone reaches the ground, it has lost all the energy, potential and kinetic, with which we endowed it. Still, this energy which has been lost by the stone has been acquired by something else. The air and ground have taken the stone's energy, in the shape of another form of energy which physicists call heat. That is the physicist's conception of the conservation of energy.

The apparently different effects which we perceive, between the stone "falling" and "at rest," are the products, not of different attributes in the stone, but of different interactions between the stone (as "units of stimulus" and "of consciousness" in states of changing and unchanging "moments of rest") and other systems, say the earth and ourselves (as responsive "units of consciousness").

When Joule ascertained the heat-equivalent of work, he ascertained the effect on himself of certain

sensory experiences elaborated into abstractions ; but he ascertained no truth regarding the objective reality of heat. The truth he ascertained was conceptual—the equivalent of the truth that “twice two is four.” Joule’s truth, at its root, was purely subjective—conceptual, because it assumed that what he could not sense (as an imagined entity—heat) was equivalent, as reality, to what he *could* sense—the objects manifesting the different states which Joule, by the artifice of imagination, separated from the sensed manifesters of those states (as heat). Of course, once grant that the product of this imaginative artifice is an entity, Joule’s conclusions are as “science” indisputable. His subjective conceptualism regarding work and heat being logically elaborated, his truth may be considered irrefragable as the truth that “twice two is four.” However, when we come to analyse Joule’s truth, in connection with what we can perceive as real demonstration, we find that it is invalidated by its premises. We find (as I shall show) that Joule’s conceptual realities, motion, space, time, have no more connection with objective reality than have the abstract numerals 1, 2, 3, 4, apart from objects of sense. The whole of mathematical physics being built on such invalid premises, we can only accept the conclusions of such procedure as representing logical processes of thought, but nowise as representing objective reality. We can only approach such reality by eliminating, to the best of our ability (which is continuously being increased through this very subjective method of conventional science), the

sources of error which we now perceive to be involved, so soon as we tacitly ignore the imaginary character of our common notions regarding the fundamental postulates—time, space, and motion. We find that these notions when analysed, are discredited by other notions which, to our apprehension, enable us to penetrate further towards the objectively real. If our anthropomorphosing tendencies, in respect to God, are now rationally superseded, so are our materialistic tendencies in regard to time, space, and motion superseded. As, through attaining a more objective purview of phenomena, we have lost the revelation of God which was adequate for our ancestors, we must attain a new revelation of God, adequate to our needs, through attaining a still more objective phenomenal purview. The conventional science which came, at its appointed epoch, to displace what we now perceive as theological superstition, is itself, in its transcendental aspect, demonstrated as a form of superstition. It has done its appointed work in demolishing theological superstition; now, its own turn has come to be demonstrated a form of superstition, so far as regards its metaphysics.

We may take it as axiomatic that all human knowledge ultimately converges to the revelation of Deity. The perturbations which lead some of us to an opposite conclusion are the evanescent incidents of mental metamorphosis. While a great change is being consummated, our mental limitations incline us to magnify fragments of the transformatory process

into the whole. Our new experiences loom so large that we fail to apprehend the greater issues of which these new experiences are merely fractional incidents. Then, we dream pretty fancies such as "atomic mechanics" and flatter ourselves that we have solved the universe. Then, our Haeckels try to soar near the free ether, on "mechanical" wings, and come dreadful "croppers," in the attempt!

In its transcendental aspect, physics has become pseudo-science, to the extent that it has lost grip of empiricism and become intoxicated with a number of abstractions, as definitions, not logical, as inference from sense-experience. Philosophical transcendentalism, on the other hand, has become truly scientific, to the extent that it lays fast hold of empiricism, as its basis of inference to abstraction, and refuses to define, except as generalisations, its inferential ultimates. Whenever we attempt to define, in terms of sensory experience, what transcends that experience, we become speculators and cease to be scientists. Not only are we then speculators, we are irrational ones, attributing to words the quality of things. So soon as "science" pretends to define in specialistic terminology what is beyond sensory empiricism, "science" becomes quackery. Non-specialistic, or universal, science, as philosophy, may pretend to define beyond sensory empiricism, with the proviso that the definitions is generalisation divorced from sensually specialistic terminology.

All processes of ratiocination based on the assumption of isolated phenomena, have no experiential

significance. All assumptions of perfectly elastic atoms, perfect fluids, and so on, imply such isolation. They imply that certain products of evolution can exist independently of all other products. Yet, it is one of the most assured conclusions of true empiricism that every constituent of the universe functions solely as an integrant of the universe—that it can only *act* so long as it *re-acts*. This involves that no constituent of the universe can be perfect in the mathematical sense. If such perfection does not exist, what is the use of ratiocination based on its assumption? How can we explain phenomena by assuming what does not occur in phenomena?

The only possible perfection is what exists. We only know what exists through our senses and inference from what they reveal. To imagine something that our senses do not reveal is quite different procedure from inference from what our senses do reveal. To call something perfect because we attribute to it qualities we have never sensed in anything, or because we divest it of qualities we invariably do sense in everything, is simply allowing our imagination to run riot. Such riot constitutes many of the main premises of mathematical physics, just as it constitutes the abstract *formulae* (points, lines, etc.) of mathematics itself. The result is merely a closed circuit of ratiocination, possibly conclusive in itself, but necessarily divorced from experiential or practical truth. This so-called scientific transcendentalism involves credal atavism to the standard of the primitive man who has not yet

evolved to discarding imagination as authentication of reality (see the first chapter in this volume dealing with the evolution of belief).

Physicists tell us that, through the conversion of what they call higher into lower energy, the universe will come to an end, as we perceive it, within "time." But if "time," as I shall show, and "energy," as I have shown, and shall further demonstrate in later chapters, are purely conceptual creations, then what physicists really imply by their proposition about the end of the universe is merely change of conception. The conditions, *ex hypothesi*, being only "energy" and "time," are but psychical ghosts. I fail to see the importance of speculation about the end of the universe which can merely tell us about the extinction of certain ghosts now mentally visualised by physicists. I fail to see why I should be more impressed by the prophecies of physicists regarding the end of the world than I am, say, by the prophecy of Professor Falb who, I see, tells us that the world is due to finish its career towards the end of this year, 1899.

When, say, Professor Jevons tells me that the available coal in this country will be exhausted in so many years, he tells me something about what I can touch and see, and to which I can effectively apply time as measure. When the physicist tells me something about the consequences of degradation of energy, he tells me something about what I cannot touch or see, and to which I can no more effectively apply time as measure than I can so apply it to a note of interroga-

tion. When I posit that burning coal in interaction with myself and air involves a feeling which I call heat, I am justified in talking colloquially of this mode of feeling as something distinct from interrelationship—as a thing in itself. Similarly, I am still better justified in so talking of the coal. But when, as a scientist, I talk of the heat as having equal objective existence to that of the coal, I am arbitrarily assuming that an ideally isolated effect of sense-perceptivity is equivalent to the perceptivity itself.

Well, if we may rightly apply this method in the case of the heat, I am justified in applying it to the sensation of pain when I place my finger on the burning coal. Why shall I not apply mathematics to determining that so much "pain" is equivalent to so much "heat," as to determining that so much "work" is equivalent to so much "heat"? And, if we adopt this procedure in regard to "pain," "heat" and "work," why shall we not apply mathematics to everything—eating our dinner, going to bed, taking an umbrella? These are all products of consciousness, just as are the "heat" and "work." Why shall we not state the equation—"time to go to bed" = "one pound of steak to dinner," as state the equation—772 foot-pounds = a unit of heat? Why shall we not mathematically determine how much we are going to eat at dinner, as so determine when the world is going to end?

Physicists tell us that the heat of the earth will eventually become so equally diffused that there will be no higher to transform into lower forms of energy.

When temperatures are thus absolutely equalised, the world as we perceive it will come to an end. All such talk arises from arbitrary estimates of "higher" and "lower," based on the fiction of energies in equivalence with work. If energies are only interaction between ourselves and matter, then their appearance, disappearance, or modification is simply a question of continuity, cessation, or modification of our interaction with matter. If we like to say the world will come to an end when any of these contingencies occur, and to posit the occurrence in any number of "millions of years"—well, we may amuse ourselves, but the world will go on its decreed way quite indifferent to our vaulting ambition as prophets.

We have now sufficient empirical evidence, quite apart from theorisings, to justify the inference that what we call gases, vapours, liquids, and solids are matter in different states of what we call temperature. Thus, air, oxygen, nitrogen, and lastly, hydrogen can now be liquefied as surely as water can be vaporised. The conventional assumption is that we add heat to vaporise water, while we abstract heat to liquefy the gases. The real interpretation is that we interact differently with the matter, according to its different interaction with other matter. The matter, as thing in itself, is the same whether gas, liquid, or solid. What we call its properties are different under the various contingencies, because its properties are the properties of our own sensations caused by varying conditions of interaction. The properties of the matter, for us as true empiricists, constitute the

matter itself. The only legitimate means of transcending this empirical identification of matter is by projecting it, through logical inference from its properties, outside the arena of materialistic definition. Later, I shall show what this involves. The heat, which, as ontological physicists, we abstract, as an entity in itself causing the mutations of the matter, is really part of the properties we perceive as the matter itself, no less such part than is liquidity or solidity.

It so happens that the conditions under which we live involve that certain matter shall be normally solid, liquid, or gaseous, as the case may be. There is nothing absolutely intrinsic to the nature of any substance in any one of these states, consequently there is not even empirical ground for positing ultimate atoms as rather hard than soft, impenetrable than penetrable, unchanging than changing. In fact, there is no real empirical ground for positing atoms at all, as discrete entities. So soon as we apply sensory definitions to what is not sensed, we affront the fundamental canon of practical philosophy—inference from sense-experience, and we have no longer any right to pose as empiricists.

The whole of transcendental physics is ontology pure and simple, and unphilosophical ontology to boot. All its concepts of material ultimates and energy imply that we can know the "thing itself," or absolute reality. It altogether ignores the basal truth that all we know must necessarily be a product of our idiosyncratic limitations—that our knowing is essentially the same thing as the "knowing" of two

substances in what we apprehend as a chemical interaction. Immediately we project ourselves into conceptualism, not as logical derivative from sensory experience, we cut ourselves adrift from our only real cognitive anchorage. Atoms, energies, ethers, space, time, motion as dealt with by transcendental physics, constitute nothing better than fanciful hypostasis, of no more account to practical philosophy than are the wranglings of medieval schoolmen.

Let me here give a little consideration to space, time, and motion, preliminary to later detailed scrutiny. We have an inherent endowment which we may call the muscular or physical sense of movement. This involves tactual sense of what we call spatial intersection and bodily extension. We have another inherent endowment which we may call psychical sense of movement. This involves visual sense of spatial intersection and bodily extension. By applying sensations of movement, spatial intersection and bodily extension in groups, we get the impressions of temporal interval and duration. But none of these experiences involves motion, time, or space as *ens*. Like colour, by way of illustration, space and time only exist as attributes of what is sensed—matter in interrelationship and in relationship with ourselves. When we think colour, we inevitably think matter under certain conditions of relationship. So, when we think space, motion, or time, we think concrete contingencies in relationship. Apart from these contingencies, time, motion, and space, like colour, are mere terms. Before we really

perceive them, as things, they must become qualities or attributes of concrete happenings. Just as we must have some specific colour before we get thing-apprehension of "colour," so we must have some specific interval or duration before we get thing-apprehension of time; or some specific bodily extension or intersection before we get thing-apprehension of "space." So of motion—it does not exist as a thing except as tactual, muscular, or visual sense of movement involving sensed bodies in states of relationship.

The tactual sense of resistance and non-resistance and the visual sense of differentiation constituting seen objects afford us the experience of spatial intersection. By interacting with a suitable arrangement of lenses we can at once diminish or extend visualised bodily extension and spatial intersection, and we could so arbitrarily modify bodily extension and spatial intersection in regard to the tactual sense could we apply means analogous to the telescope which really creates and annihilates "space." When we move our hand through "space" to touch an object, we accomplish by inherent endowment, so far as space is concerned, essentially what we accomplish "artificially" when we gaze through the object-glass of a telescope. The space we artificially create through the telescope is as real, *qua* "space," as is the space we create by inherent endowment, through the tactual sense of movement, non-resistance, and resistance. Similarly, the space we annihilate by gazing through the eye-piece of the telescope is

equivalent, *qua space*, to the space we annihilate by the tactual sense of contact. Whether we touch or do not touch the object; whether we look at it through one or another end of the telescope, there is no space for us except as relationship between bodies.

As above indicated, bodily extension and spatial intersection are entirely distinct from space as an entity. What we call space is conceived, not perceived. The perception of bodies, singly or in relation, involves the conception of space, not—as some introspective speculators have hypnotised themselves to imagine—the converse: perception of space involving conception of bodies. This applies to time. We conceive time through perceiving events, or concrete happenings. The temporal equivalent of spatial extension is any specific happening. This we call duration. The temporal equivalent of spatial intersection is differentiation between happenings. Time, as an entity, we abstract as conception, from relativity of happenings, as we abstract space, as conception, from relativity of sensed bodies, and again, as we abstract motion, as conception, from physical sensations of movement. Bodily extension, spatial intersection, temporal interval and duration, movement are things of sense. Motion, space, time are phantoms of conceptualism.

What I state above regarding space, time, motion applies, in principle, to the ordinary so-called energies—light, heat, electricity, magnetism. These are

only ideally disjunct from the properties or attributes which constitute, for us, sensed bodies. So of numbers, which are intellectualised intersections between acts of sensory apprehension, just as space is another such intersection. What we call addition is a memorised succession of intellectualised intersections between sensory percepts which, as arithmeticians, we mentally transmute into symbols arbitrarily isolated, as conception, from their sensory substrata. This applies to all arithmetical processes which are, ultimately, intellectual groupings of memorised intersections between sensory percepts. Just as we imagine space or time as an entity in itself, not in its true character as a mere intersection between sensed bodies or happenings, so we imagine numbers as independent entities, not in their true character as mere expressions of grouped acts of sensory apprehension. Applying this procedure in transcendental physics, geometry, and mathematics, we get a host of logical *châteaux en Espagne* with as much relevancy to practical philosophy as has "Jack the Giant-killer."

That we can imaginatively attenuate what we sensorially perceive into what we cannot sensorially perceive and can mathematically deal with the imaginative products as having objective existence, does not constitute, in the transcendental truths we so attain, the equivalent of what is mathematically verified regarding real objects of sense. Applied to such objects, mathematics is a powerful means of attaining practical truth. Then, we legitimately

apply our geometrical visualisation and numerical symbolism, as serviceable logic, to facts established by our senses. But transcendental physics implies that what we can imagine, as analogy to what we can sense, is as valid as premise for a system of inference as is sensory intuition itself. Thus, this transcendentalism virtually reverts to the mode of verification of the primitive man who had not yet learnt to deny products of imagination as the equivalent of actual experience. As the savage supposes that what he imagines in dreams is as real as what he touches and sees when awake, so does the transcendental physicist imply that what he imagines as atoms, ethers, energies are as real as is what he touches and sees as properties constituting objects of sense. He tacitly affirms that the properties are not really all that constitute the objects for him, and that if he imagines other things, as atoms, ethers, energies, devoid of these properties, he deals with conditions not essentially different from those affording him the sensory premises which he pretends to elaborate, but for which he really substitutes new premises entirely different in kind. Obviously, his procedure merely re-states the ultimate problem of sense-experience and has no significance in itself, but as a process of abstract ratiocination based on assumed fictions.

What I write now has no bearing on the legitimate application of mathematics to real empiricism. So far as mathematics enables us to deal practically with "energy" and "matter," it is within its arena,

just as is grammar when it deals with verbal arrangement. I only protest when mathematics, applied to chimerical definitions, is invoked to override true empirical inference, demonstrating a dependent cosmos and a self-existent Cause.

CHAPTER VII

THE TRANSCENDENTALISM OF PHYSICS

THE essential difference between the transcendental scientist and the ordinary sensualist lies in their respective methods of dealing with time, space, and motion, rather than in their methods of dealing with notions of "matter." Though both mentally manipulate "matter" conformably with sensory limitations involving geometrical visualisation, the ordinary sensualist may be said to create his temporal and spatial contingencies as the issues of his sensory percepts of "matter," while the transcendental scientist creates his "matter" as the issue of temporal and spatial concepts divorced from sensory percepts. Stated in another way: the crude sensualist deals with spatial and temporal contingencies in what I may term gross quantities (as sensed relationships), as the issue of his so dealing with gross or sensed quantities of "matter," while the transcendental scientist deals with imagined concrete insensibles as the issue of imagining infinitesimal temporal and spatial contingencies. The one procedure is the

converse of the other, and the sensualist's is normal, the scientist's abnormal, inasmuch as space and time are only, as I have already indicated, conceptually possible as the issue of sensory percepts of relationship. Effete philosophy of the schools has contended that concepts of time and space are the prior conditions of sensory percepts of matter. In these days of evolutionary demonstration it is hardly necessary to devote attention to views involving that human mind is a thing independent of human body. Once grant the demonstrations of physiology, psychology, and biology, it is futile to deny that percepts must be the antecedents of concepts—that "matter" as sensed properties, or what we call bodies, mentally existed before "time" and "space," and was "creator" of "time" and "space."

To illustrate the contrary methods of the sensualist and scientist: the sensualist perceives, say, rings in the air formed by a tobacco-smoker. He can visualise into geometrical percepts the varying appearances of these rings—see them change shape, move out of existence. He can sensorially time these mutations. Now, the scientist does not see his rings; he merely imagines them. Or, can he feel, weigh, and otherwise test his ether, as the sensualist can feel and test his air. So, the scientist has to imagine his ether as he has to imagine his vortex-rings. The scientist can only accomplish his feats by transforming the sensualist's time, space, and motion which the sensualist verifies by his percepts of concrete matter, into concepts of hypothetical contingencies out of real

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space, time, and motion, because outside the only conditions which afford us the experience of space, time, and motion. The mathematical formulæ by which the scientist expresses these concepts involve mere logic stated in arbitrary terms. In themselves, these formulæ have no more real significance than have the rules of syntax. Yet, the scientist applies them to validating his ether and vortex-rings, and, occasionally, pretends—much to the injury of ordinary folk too apt to take scientists at their own valuation—that his formulæ constitute all the explanation needed by mankind, of the mystery of the universe.

It will be seen that, while the sensualist makes the visualised smoke-rings the criteria of sensorially perceived spatial and temporal contingencies, the scientist reverses the procedure by making conceptual, spatial, and temporal contingencies the criteria of “vortices” and “ether.” While the scientist imagines time and space, to enable him to verify vortex-rings and ether, the sensualist sees rings and other objects, in order that he may verify time and space. Thus, the sensualist applies what he sensorially *perceives* (the rings, etc.) to verifying what he only *conceives* (time and space); while the scientist applies what he only *conceives* (time and space) to verifying other things which he only conceives (vortices, ethers).

Thus, while the sensualist infers from sense-experience, the scientist only infers from an imagined analogy to what the sensualist sensorises. Accordingly, the scientist does not argue from sense-experi-

ence, but from imagination. Now, as the scientist's vortices, ethers, are merely conceptualised smoke-rings and air, and his motion and time are merely conceptualised transformations of acts of sensory apprehension of bodily relationship involving movement and rest, it is obvious that all the scientist accomplishes in elaborating his vortex and ether theories is to apply empiricism to imagined analogies of the sense-experiences to which the sensualist applies his empiricism. Inasmuch as the scientist's concepts only exist as imaginary refinement of the sensualist's empiricism, the scientist really achieves nothing more in fabricating his vortices and ethers than the sensualist achieves in fabricating his gross notions of objects as properties in spatial and temporal relationship.

As everybody agrees about the qualities, say, of a spade, while hardly two scientists agree about the qualities of a "vortex-atom"; as everybody agrees about the qualities of air, while only a few scientists agree about the qualities of ether; as air does everything we require in the way of a medium, while different ethers have to be invented to meet the contingencies of "light," "electricity," "gravitation" which no man has sensorially verified—under these circumstances, I ask, what is the significance of all this monumental effort of the scientist? and I answer: a mouse! I say, so far as regards real explanation, the throes of the mountain of scientific transcendentalism yield a mouse.

Suppose mathematicians agree that a certain sort

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of ether will conceptually answer the conditions of what scientists call transmission of light, *cui bono*, if nobody can sensorially perceive such a thing as light? Suppose mathematicians can describe a square circle, who will be any the better for the description? Suppose mathematicians can identify four-dimensional "space," who cares about "space" any more than he cares about the colour of a parallelogram? Suppose a hypnotised neuropath can tell you how it feels to be a glass bottle, are you any the better for the information? So far as philosophical explanation is concerned, the mathematician's transcendental exploits are not a jot more significant than are the hypnotic's experiences as a glass bottle!

The transcendental scientist talks of billions and trillions as nonchalantly as the ordinary sensualist talks of dozens. Professor Lodge tells us that the ether inside crown glass transmits vibrations "at twenty thousand million centimetres per second." As regards real explanation, the professor might as well tell us that the man in the moon eats twenty thousand million pancakes per second. Again, the professor tells us that "the ether outside the glass can do still better than this; it comes up to thirty thousand million, and the question arises what is the matter with the ether inside the glass that it can only transmit undulations at two-thirds the normal speed. Is it denser than free ether, or is it less rigid." Obviously, the scientist has to invent an ether that will transmit vibrations inside glass at twenty thousand million per second, and outside glass at thirty thousand

million. He is equal to the occasion, being the greatest inventor of the age. He tells us that the density of ether in free space is correspondingly different from its density inside matter. In other words, matter which is ultimately bound ether, as vortices, piles up ether which is not matter so as to transmit vibrations at twenty thousand million, instead of thirty thousand million centimetres per second !

Professor Lodge tells us that "it is not feasible at present to produce recognisable vibrations of any such rate as a billion per second ; whereas to affect the retina they must be at least 400 billions per second." Again, "this natural unit of electricity is exceedingly small, being about the hundred-thousand-millionth part of the ordinary electrostatic unit, or less than the hundred-trillionth of a coulomb." Again, "the electric force between two atoms at any distance is ten thousand million billion billion times greater than their gravitative attraction at the same distance. The force has an intensity per unit mass . . . nearly a trillion times greater than that of terrestrial gravity near the earth's surface." I will confess that such statements as these are billions or trillions of times beyond what *my* gravity can assimilate !

As we know nothing, as indicated in the preceding chapter, of numbers except as conceptualised issues of sensorial experience of difference, what is the use of applying numbers to what is utterly beyond sense-experience ? If logic on the top of imagination

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drives us into billions and trillions, that only proves we can imagine more than we can perceive, and that we can imagine, like the savage, that what holds good in imagination holds good in perception, as actuality.

Lord Kelvin writes (*Constitution of Matter*, Macmillan, 1891): "There is in sober earnest this very important thing to be attended to, however, that in chronometry, as in geometry, we have absolute continuity, and it is simply an inconceivable absurdity to suppose a limit to smallness whether of time or of space. But, on the other hand, whether we can divide a piece of glass into pieces smaller than the hundred-thousandth of a centimetre in diameter, and so on without breaking it up and making it cease to have the properties of glass, just as a brick has not the property of a brick wall, is a very practical question, and a question which we are quite disposed to enter on." Whatever may be the practical aspects obvious to Lord Kelvin, I submit that as smallness and largeness depend on sensory ability to recognise "size" as comparative property, and not on the ability to imagine it as unsensed analogue of comparative property, smallness and largeness are annihilated so soon as sensory criteria are annihilated—so soon as we cannot sensorially differentiate. We can so differentiate if we can separately identify, say, 500,000 people in a city; but we cannot so differentiate two atoms, or two molecules, or two fragments of glass which we cannot visualise. I maintain that, just as the brick is not the wall, so is the conceptualised glass of Lord Kelvin not glass. I say that only so many "mole-

cules" as Lord Kelvin can sensorise, as the properties we call glass, are glass. If Lord Kelvin can sensorise his "glass" as a particle smaller than the hundred-thousandth of a centimetre in diameter, it *is* glass; if he cannot, it isn't glass, whatever he may call it, or whatever "light," chemical reaction, or anything else may do with it. I maintain that Lord Kelvin's conceptualised glass is no more glass than a duck's egg is a duck. I maintain that imagined glass outside sensory perceptivity is "units of stimulus and consciousness," not "atoms," "molecules," or glass. And I maintain that it is a very practical concern of humanity to realise the fact. Corollarily, I contend that "it is simply an absurdity"—I will not say an inconceivable one—*not* "to suppose a limit to smallness," for smallness and largeness have no existence except as sensed comparisons of properties, or what we call bodies, in comparative relationship; in other words, smallness and largeness are merely terms defining sensible objects. If we apply smallness or largeness to a sensory object, we apply the term as definition of sense-experience. If we apply the term to an insensible, we apply it as definition of a concept to which, if we are a transcendental physicist, we attribute by imagination the quality of a percept of sense. The implication of Lord Kelvin is that smallness and largeness, like his ultimate atoms, are entities outside relationship, and yet I suppose Lord Kelvin has scant regard for ontologists.

One of the properties of glass, as of a brick wall, is that it may be seen. Again, to be glass, it must

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exert certain effects on touch. If it do not manifest the qualities which we sensorise as characteristic of its nature, it is no more glass than a sensation of blackness is one of whiteness. Any fragment of glass we can identify by its characteristic effects on sense may be part of an original glass sheet, just as a brick may be part of an original wall. But if we grind the brick to powder, and project something we once sensorised as glass into invisibility and intangibility, the insensible product of glass is no more glass than the powdered clay is a brick. We may pile up the powdered clay, and say : this is a brick, just as we may apply luminar and other tests to the insensible "glass," and say : this is glass; but the assertion in each case, if seriously made as true definition, will be based on imagination, not on sensory demonstration. In each case we shall confound a concept with a sensory experience. We normally create glass as we create the brick—by applying "personal artifice" (to be later elucidated in detail) to special sense-reactions, not by applying "personal artifice" to conceptual elaborations of those reactions. So soon as we transform glass into "molecules," we have done with sense-reaction, and project ourselves into the empyrean of imagination, deluding ourselves by the sophism that "molecules" of something that was once glass are equivalent to glass, whereas they are no more so equivalent than is the mathematical concept of a point to a real point, or an imagined pig with wings to a real pig.

It may be urged that sensory experience as "personal artifice" is itself ultimately an imaginative

manifestation, and that whether we call certain insensibles "glass" or "molecules" derived from glass does not matter. I reply: it matters vitally, because it involves confounding an abnormal with a normal process of inference, and so leads us into endless quagmires of false speculation regarding the most important question affecting humanity—morality.

Assuming that sensory experience, like conceptual experience, is ultimately imaginative, the vital point is that which I have urged in earlier chapters dealing with truth and monistic speculation, and shall further establish, that behind all imaginative issues of "personal artifice," involving *defined* sense-experience, there is "unsymbolisable sensation" of something not ourselves involving experience of externality quite independent of symbols. This "unsymbolisable sensation" is the essence of sense-experience, and absolutely demarcates it, as demonstration of, for us, basal reality, from all later conceptual elaborations.

Provided any particular conceptual elaboration is genealogically bound to this "unsymbolisable sensation" of externality, such elaboration is normal and valid as a derivative from sense-experience, however far it may transcend that experience. On the other hand, if any particular conceptual elaboration is not based on this "unsymbolisable sensation" of externality, but is merely based on what affects the imagination as being *analogous* to experience arising from the "unsymbolisable sensation," that conceptual elaboration is abnormal and spurious. Such elaborations

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tion is that by which mathematicians fabricate (through invoking spatial and temporal relationships as equivalent to time and space as entities) their "ethers," "atoms," and "points." All are utterly divorced from sense-experience, and, as posited by mathematicians, involve a mere circle of logical inference from chimerical definitions.

Lord Kelvin continues, "I wish in the beginning to beg you not to run away from the subject by thinking of the exceeding smallness of atoms. Atoms are not so exceedingly small after all. The four lines of argument I have referred to make it perfectly certain that the molecules which constitute the air we breathe are not very much smaller, if smaller at all, than one ten millionth of a centimetre in diameter." Lord Kelvin measures molecules by the undulatory theory of light, phenomena of contact electricity, and capillary attraction. Accordingly, he measures in the case of light and electricity by standards which I have shown to be outside sensory perceptivity, mere concepts. In the case of capillary attraction, he measures by the effect of a film of oil on camphor movements on a water surface. The thickness of the oil film is calculated to be "from 81 to 265 times the inferior limit, and from .4 to 1.3 of the superior limit, which I have assigned for the probable distance between any point of water or other ordinary liquid, and the corresponding point in the nearest neighbour molecule." I submit that molecules themselves are mere products of conceptualism, as is the definition of thickness. The definition of

the thickness has no more sensory ground than it would have if posited as zero—nothing. As we can only apprehend thickness as objectively real, through sense applied to bodies in relationship, so soon as thickness becomes merely conceptually real, it becomes, as objective existence, annihilated. If the film has only conceptual thickness, the thickness only exists in imagination, as does a flying pig. If it can so exist and still be something, it must be a something not thickness; in other words, it must be what I shall later discuss in detail—"units of stimulus and consciousness" outside concrete definition.

If thickness defined in terms of sense-experience, but yet transcending sense-experience, is still something, then zero, which can be so defined, is also something, and something is nothing. Against this, it may be urged, if the film is sensorially perceived as surface, it must have thickness. Undoubtedly; but what this "thickness" is, is something undefinable but inferred; in other words, the "units" I propound in this work. I merely maintain we have no right to apply to this thickness definitions which have no real validity unless testable by sensory experience. If we like to abstract these definitions of insensible thickness, of course we may do so, just as we may abstract the idea of an angle from visualised objects. The thickness, as definition of an idea, then exists just as does the imagined angle, or as it would do imagined as zero—nothing. We can imagine a multitude of impossible contingencies. If we admit imagination in one case, why

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not in another? Of course, we are bound to *infer* something we call thickness for the film; but when we also infer spatial dimensions for that thickness, we raise the question of the warrant of spatial criteria for what we cannot sensorise in space.

It may be asked: What if we could microscopically increase the thickness so that we could see it? Then, I reply, we should bring the question of definition within sensory contingency and be justified in stating the thickness in terms of space, just as we shall, conversely, project, for ourselves, the film out of spatial relationship, if we go into another room. Of course, we shall still *infer* it is in spatial relationship after we have left the room, but that inference would be based on the sensory experience of other people, involving for us the conviction that films do not move away merely because we move away. We should then believe the film still existing through inference from indirect sensory experience involving that other creatures constituted, as we believe, like ourselves, perceive objects that we can transiently only perceive through memory and imagination. Lord Kelvin, on the other hand, professes to verify the thickness of the film, through inference, not from sensory experience of himself and others, but from an imaginative contingency involving that space is an entity equivalent to an object of sensory experience. Really, the thickness of the film is as much outside Lord Kelvin's experience as the film itself would be outside his immediate sensory experience when he did not see it. Dimensions that cannot be

sensorised are a contradiction in terms, just as is flavour that cannot be tasted.

Professor Lodge tells us that there is no such thing as action at a distance, and that therefore it is necessary to postulate an ether abolishing "distance" through possessing the quality of absolute continuity—solidity. Here, again, we have hypostasis of concept. What is absolute solidity more than a ghost of imagination arising through sensory percepts of comparative properties, just as a mathematical point is another such ghost? We only know solidity as a property in contradistinction to what we call impalpability. Nobody can demonstrate, by inference from sensory experience, absolute solidity any more than he can demonstrate a mathematical point. They can only be imagined as analogies of comparative properties, or sensed objects. Transcendental physics exists only through confounding imagination of analogies with inference from sense-perceptivity. Its basical premises are really ontological, while pretendedly empirical. As such they are spurious.

The professor writes: "Now if there is one thing with which the human race has been more conversant from time immemorial than another, and concerning which more experience has been unconsciously accumulated than about almost anything else that can be mentioned, it is *the action of one body on another*; the exertion of force by one body upon another; any kind of effect, no matter what, which can be produced in one body by means of another, whether the bodies be animate or inanimate. . . . Every activity of

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every kind that we are conscious of may be taken as an illustration of the action of one body on another. . . . If a man explained the action of a horse or a cart by saying that there was an attraction between them varying as some high direct power of the distance, he would not be saying other than the truth—the facts may be so expressed—but he would be felt to be giving a wretchedly lame explanation, and any one who simply pointed out the traces would be going much more to the root of the matter. Similarly with the attraction of a magnet for a distant magnetic pole. To say that there is an attraction as the inverse cube of the distance between them is true, but it is not the whole truth; and we should be obliged to any one who will point out the traces; for traces we feel sure there are" (*Modern Views of Electricity*, Macmillan, pp. 388-390).

The traces are the continuous medium—the ether: "a substance in which they" (atoms) "are embedded which penetrates into all their interstices, and extends without to the remotest limits of space. . . . There is now continuous contact between the particles of bodies, and if one is pushed the others naturally receive the motion. . . . Gravitation is explicable by differences of pressure in the medium, caused by some action between it and matter not yet understood. Cohesion is explicable also probably in the same way. Light consists of undulation or waves in the medium; while electricity is turning out quite possibly to be an aspect of a part of the very medium itself. The medium is now accepted as a necessity

by all modern physicists, for without it we are groping in the dark ; with it we feel we have a clue which, if followed up, may lead us into the innermost secrets of Nature " (pp. 395-396).

The reader will notice that the above propositions of Professor Lodge ignore the psychological limitations of perceptivity and imply that contingencies created by sense-perceptivity must necessarily apply outside that perceptivity, and that imagined analogies of sense-experience are equivalent to inference *from* that experience. If we invoke sensory limitations to decide the necessity of pull and push, we must show, within sensory limitations, that something is pulled or pushed. If we talk about light and electricity as needing conveyance by material contacts, we must show that light and electricity are sensorially perceived, say, as are the cart and horse. If we cannot show that light and electricity are so perceived, we annihilate time and space as factors in the contingency, inasmuch as time and space only exist as relationships, not entities, through sensory perception of objects involving differentiated acts of sensory apprehension. Though we may infer from sensed objects that matter is ultimately insensible, we cannot infer that what we only conceive (as time and space) through its sensible state applies to it in the insensible state. Or, again, can we imply that what we only perceive as interaction between ourselves and sensed matter (electricity and light) needs conveying as does, say, a load of potatoes ; or that what we conceive as force needs what we either perceive or conceive to convey

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it, any more than does what we conceive as, say, love.

If we would establish the existence of ether, we must not merely imagine analogies and treat them as inferences, we must upset arguments such as those I advance in this work, showing that notions of time and space are "caused" by, not equivalent to, sensory perceptions. We must show that space and time are real things, such as the traces connecting the cart with the horse, before we can apply space and time as criteria of contingencies affecting unsensed matter. If space and time are not such real things, but are mere conceptual ghosts born of "personal artifice" (to be dealt with in later psychological and metaphysical chapters) involving sensory perception, then they do not exist outside sensory conditions, and it is futile to apply them to validating the existence of ethereal "traces."

We only need "traces" so long as we have something to pull or push—that is, within temporal and spatial conditions. We have no experience of anything we can pull or push, unless we can see or touch it. When we imply that things we cannot see or touch are pushable or pullable, we launch ourselves on the ocean of speculation divorced from sense-experience and contrary to logical inference from it. No inference from sensory experience is involved in conceiving insensible analogies to concrete objects, and applying to the concepts conditions only perceived through sensed objects.

There is not a jot of real reason why I shall not say that ether is no more solid than is air. What

better ground has Professor Lodge for denying "space" between ether constituents than between air constituents, or between the door and window of a room? I say he has no ground at all, except that he chooses to imagine a vacuumless incredibility because he finds that concrete objects are only affected by contacts, and he wants to treat what he can imagine as though it were what he can sensorially perceive. Of course we may build logical theories by adopting false premises, but, I submit, these theories must be intrinsically worthless as real explanation of anything.

To imply, as does the transcendental physicist, that mere concepts need conveying as do concrete objects, is the acme of speculative excess, quite on a par with the achievements of the metaphysical theologian. Once grant either speculator his premises, he can prove anything. Allow to the physicist that what obtains in the case of sensed objects obtains in the case of imagined insensible analogies to those objects, and that the analogies are equally real as are the objects, he can, of course, invoke a wide range of induction to establish a logical edifice of abstraction, and he will occasionally anticipate by theory what he later verifies by observation; but after all is granted, he has done nothing to authenticate his imagined concepts as equivalent to sense demonstration. We are continuously reaching passably sound conclusions from unsound premises. Such effects warrant the premises as assumptions, but nowise authenticate them as representing actualities. Thus, the corpuscular theory,

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which physicists now reject, "explained" a multitude of effects of light imagined as a material entity.

The issue which I raise is : Do ethers, atoms, light, electricity, motion, space, time as imagined and dealt with by transcendental physics represent real things or inference from real things? I say they represent neither, and I ask those who maintain the contrary to controvert my position as I have controverted theirs. I say that mere imagined analogies are utterly spurious as the bases of a theoretical system pretending to validate itself by sensory criteria. I say that such a system has no warrant to affirm more than it can establish by empiricism, and that it has not a jot of empirical ground for propounding definitions of ethers and atoms as representing real things equivalent to sensed objects.

Astronomy is based on the implication that motion and space are entities, sensed as are objects around us. Because, for instance, by measuring a base line, we can determine sensed relationship, as "distance" on earth, astronomy infers we can apply the method of trigonometry to objects outside sensed spatial relationship. The inference can only be allowed if we assume analogies that we have no real means of authenticating. We really have no means of measuring the relationship to ourselves, or what we call the distances of stars, equivalent to that of measuring sensed relationships. As space is only what we conceive through sensing concrete relationships, it ceases to exist so soon as those relationships cease to exist, whether it be assumed as distances

involving the imagined contingency—millions of miles, or the contingency—millionths of a centimetre. When, for instance, astronomy determines a stellar parallax, it assumes that imagining two “sides” in space is equivalent to observing two sides on earth. Thus we come to attribute to the concept “angle” the same reality which we attribute to the actual figure of an angle as an observed relationship of specific concrete parts. In the same way we transform numbers which have no significance outside imagination unless as symbols of concrete relationships, or acts of sensory apprehension, into realities independent of such relationships.

Of course, this method is practically admissible as enabling us to formulate consistent theories; but it involves nothing approximating to real explanation. It may be urged that it enables us to explain what we perceive. I say it does not. It merely enables us to imagine that what we do not perceive is equivalent to what we do perceive. Space and time are merely states of our mind involving ghosts of sensed relationships. I may as well say: pity = benevolence and sympathy, as say: the diameter of a circle = two radii. The concept pity, on the assumption that I believe my definition, is as much for me equivalent to benevolence and sympathy as the concept, diameter of a circle, on like conditions, is equivalent, for the geometer, to two radii.

But, it may be urged, everybody recognises that the geometer’s definition is truth, while some people might dispute my definition of pity. I deny this.

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I assert that, if everybody likes to think "pity" as I think it, he will agree with me as completely as, on like conditions, he will agree with the mathematician. If you show me a specific drawing of a circle, and tell me that a straight line drawn through its centre to each side is what you call a diameter, and is equal to each part of the line divided by the centre, I say that your propositions are only really valid so long as you show me a "centre" I can sense, differentiating the line as "radii." If you show me such a centre, your definition only involves that I can divide a straight line into two empirically equal parts by a visualised point. But if, as a mathematician, you say that what I visualise, as circle, centre, and line, are not at all what you conceive; that your circle, centre, and line are "perfect" entities without body or parts—then, I say: your ghosts may be perfectly real to you, but have no significance for me, except as illustration of your liking for the savage's method of verifying by imagination. I say that your definition of the centre, etc., on the conditions, is just as disputable as is my definition of pity. Our definitions are equally arbitrary as being divorced from logical inference from sense-experience.

If you can show me that your "perfect" centre, line, and circle are necessary products of inference from my "imperfect" sensory factors—if you can show that your imagined ghost-point is necessarily implied by my visualised body-point—I will yield to your demonstration. If you can only tell me that the fact of your being able to imagine the ghost-

point renders it as real as my seeing my body-point renders that real, I reply : A lunatic may, on the same ground, ask me to accept his ghosts. Because my sensible centre exists, no more involves that your insensible centre exists as anything but the ghost of my sensible centre, than a shirt seen at night on a clothes-line, as a visitor from spirit-realms, is not all the same a mere common thing of body transfigured into illusion. I say that your ghost-point is equivalent to that shirt-ghost.

But, it may be urged, the mathematician's geometrical ghosts are essential to modern science. This I grant ; but only in the sense that numbers are essential—as symbols. An abstract point or line is no more a thing in itself than is an abstract number. These are only machinery by which we mentally elaborate the real things—sensory percepts. So of atoms, ethers, energies, space, time, motion—so long as we merely apply such concepts as symbolic machinery for elaborating sense-experience, they are perfectly valid. The mischief arises through our confounding them with sense-experience itself, or with its ultimate synthesis, for which they are merely arbitrary substitutions, just as—by way of illustration from another arena of sensibility—are the terms by which we define emotions. Here, the emotions are the things for which we substitute, in mental elaboration, various symbols (love, hate, etc.). Nobody thinks of confounding the symbol, love, with the emotion itself, as the mathematical transcendentalist confounds the symbol, line, with the sensory

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experience. This misapplication of symbols permeates theoretical science and leads naturally to the grossest materialism.

Astronomers tell us that the nearest fixed star, *α Centauri*, is 270,000 times the distance of the sun from the earth. They tell us this on the authority of imaginary lines in an imaginary entity, forming imaginary angles measured on an imaginary sphere. The imaginary lines are supposed equivalents of what we sensorially perceive as lines of direction between concrete relationships. The imagined angles and sphere are supposed equivalents of what we can only perceive by perceiving spatial intersections of acts of sensory apprehension involving specific concrete bodily extensions. The astronomer's realm of verification is here obviously of an essentially different character from that involving the premises from which he professes to infer, but for which he really substitutes other radically different premises based on the assumption that what he can imagine as the equivalent of sensory experience is such equivalent. On the same warrant as that of the astronomer, we may assume that the written sign, love, is equivalent to the emotion constituting what the sign symbolises. Here we should adopt a process of substitution equivalent to that of the astronomer, except that while he substituted imagination for sensory experience, we should substitute sensory experience for emotion.

Instead of arguing from sensed relationships, to space, the astronomer argues from space, to sensed relationship. The lines constituting angles, and the

circle by which we normally measure such angles, are, as originally cognised, concrete things to which we apply certain symbols. As assumed by the astronomer, the lines, angles, sphere are certain symbols to which he arbitrarily attributes the quality of concrete things. Thus, he reverses the normal cognitive succession. Whereas we normally evolve concepts from sensory experience, the astronomer evolves imagined sensory experience from concepts. He applies to acts of sensory apprehension (celestial bodies) out of sensed relationship, the criteria he applies to acts of sensory apprehension (terrestrial bodies) within sensed relationship. This does not render his conclusion regarding the celestial bodies equivalent, as truth, to his conclusion regarding the terrestrial bodies. His "millions of millions of miles" in the celestial regions are no more equivalent to his "hundred miles" on earth, than the physicist's "millionths of a centimetre" in the realm of ethers and energies are equivalent to his "feet" and "yards" in the realm of timber and broadcloth.

Of course, this essential difference, as truth, between the astronomer's conclusions regarding celestial and terrestrial bodies need not practically invalidate the celestial truths. The astronomer can compile an effective "Nautical Almanack" notwithstanding his philosophically peccable conclusions, just as the physicist can compile an effective table of specific heats, on like conditions. If we imagine "millions of miles" or "millionths of a centimetre" as equivalent to "six feet" or "half a yard" as reality, there is

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nothing to prevent our practically applying our imagined verities to celestial bodies and energies analogously as we apply our sensed verities to timber or broadcloth. The same geometrical visualisation affording us sensory experience of a yard of broadcloth affords us imaginary experience of a star "millions of miles" away ; so, if we scrutinise stars by this geometrical proclivity, we can attain a body of practically efficient truth regarding stars, just as we can attain a like body of truth regarding sensed terrestrial objects to which we apply the same geometrical proclivity. But, we must not forget that our "millions of miles" are nowise equivalent, as reality, to our yards and feet, or to true inference from our yards and feet, but are merely arbitrary substitutions imposed by imagination, in place of the sensed relationships and without any significance as true inference from those relationships.

I will now incidentally anticipate a little of what I shall later discuss in detail regarding the reality underlying our common notions of celestial movements and distances. First, we will take the supposed revolution of the earth about the sun, and the earth's supposed rotation on its axis. We could only tell if the earth ceased revolving about the sun through our inability to experience what I shall later demonstrate by inference from sensory experience, as "changing moments of rest" involving apparent movement for the sun, but really constituting "movement" internal to ourselves. From this standpoint, that the sun appears and disappears, does not really involve that

the sun itself does anything, or that the earth does anything, but that our sensations do something, involving that we derive varying "units of consciousness" through interacting with the sun. That the sun goes from our sight does not involve that the earth, as active agent, turns one or another side to the sun, but that the sun and ourselves interact as what I demonstrate as "effective" and "ineffective" "units of stimulus and consciousness."

Thus, I do not contemplate the sun and earth as prime efficient. The real efficient, so far as I am concerned, is my own mind which experiences "effective" or "ineffective"—as the case may be—"units of consciousness," through interacting with the sun. Thus, to me, it is correct to say: our sensations "move" the sun (if we consider his so-called proper motions) or the earth (if we consider the sun's apparent movement), not *vice versa*. Once the movements in ourselves (as what we call scientific discovery) apply to sun or earth, they will continue to apply until some other interactions arise between ourselves, sun and earth, involving different "units of consciousness" in ourselves—equivalent to what we call fresh scientific discovery. Accordingly, for me, all such talk as we commonly hear, belittling humanity on account of the immensity of celestial phenomena, is puerile, inasmuch as the immensity only exists through our own sensations.

When we look at the heavens from a bare plain, or the open sea, we see them as the inside of a figure which we call a dome or vault. We picture the

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completion of the dome into a sphere through certain concrete experiences affording us the notion that the earth is a spherical body, and we perceive certain heavenly bodies from one side of the earth; other bodies from the other side. On the earth, we measure bodies as remote or near, which relationships we call distances. They arise through the effects of "effective" and "ineffective" "units of stimulus" constituting the bodies, on ourselves, as "units of consciousness." The more "effective units" a body yields us, the more clearly we feel we perceive it, and the nearer we call it. If a body is practically isolated from other bodies, we guess how near or distant it is through feeling its "effective units of stimulus" and mentally comparing them with what we memorise as the greatest number of such "units" affording us what we consider the clearest visual perception of the body. When such a body is not isolated, we measure its "distance" by experiencing the "effective units" constituting other bodies as well as the particular body the distance of which we are concerned to determine. Here all our determinations are by concrete relationships. (These points will be fully elucidated in later chapters dealing specifically with time, space, and motion, and with units of consciousness and of stimulus.)

In regard to heavenly bodies, we have no concrete relationships enabling us sensorially to judge of nearness or remoteness by comparing "effective" and "ineffective" "units." Accordingly, we sensorise these heavenly bodies, as distant or near, not by com-

paring one with another, but by comparing particular parts of the hemispherical interior, which we call the heavens, in which these bodies appear to be situated. Here, we make the shape of the celestial "interior" the sensory criterion of distances, not, as in the case of terrestrial bodies, the relationships between the bodies themselves that criterion. In the case of the heavenly "dome," its "top" decides the greatest sensed vertical distance of the body. But the "dome" itself is nothing but "space" constituted by the apparent relationships between the heavenly bodies themselves. Accordingly, "space" here decides sensed distance, so far as concerns us and the heavenly bodies, instead of, as normally, bodies deciding it. Such determination of distance only apparently applies to a terrestrial dome and objects within it. We do not, in the case of a concrete dome, constitute the dome itself the criterion of distance. The spatial relationships between objects within the dome are then determined quite irrespectively of the figure within which they are contained. This occurs because the figure itself is determined by its relationship to other concrete figures about it, which again are similarly determined by other concrete figures, all affording us graduated experiences of "effective units of stimulus" leading to objects in the dome. So, though the interior of the concrete dome affords us different sensed distances, the resulting experiences all issue through relationships of "units of stimulus" constituting concrete objects, and ourselves; not through the mere shape of the dome.

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The difference we sensorially perceive between ourselves and heavenly bodies really visually annihilates space. Only as between one of these bodies and another, not between them and ourselves, do we really visually sensorise space. If we lie on our back and gaze into the clear celestial vault we do not sensorise heavenly bodies as vertically remote from ourselves. We only imagine the vertical distances through mnemonic habit connecting us with objects about us and the earth under us, and imaginatively associating these with the heavenly bodies. The distances we then sensorise in gazing at the heavenly bodies are not between ourselves and them, but between one and another of them. This latter spatial connection constitutes a genuine sensory experience corresponding to that affording us spatial experiences on earth, only we cannot apply to these celestial relationships the measurements we apply to relationships on earth. Though we have concrete relationships between the heavenly bodies, as between the objects about us, and we really visually fabricate "space," the "space" is not between us and the heavenly bodies, but between those bodies themselves. The vertical distances we imagine, as between ourselves and the heavenly bodies, do not constitute true sensory percepts of spatial relationship, but are created by the artifice of mental habit forcing us to imagine the concrete objects around us as bound to the heavenly bodies as these concrete objects are bound to one another and to us.

What applies to sight applies analogously to touch.

What we tactually experience as an object are the tactual "effectives" we perceive. Given tactual effects corresponding to those visually attainable through the Röntgen "rays," we should be able to transform certain tactual "units" which we now experience as "effectives" into "ineffectives." Then, we should say that matter was impalpable that we normally recognised as palpable, as we should say, in the visual contingency, that matter became invisible. Were tactual annihilative contingencies now within experience, as are visual, we should have complete empirical demonstration of the truth for which I contend; that we know nothing of matter except what we make it by "personal artifice" derived from "unsymbolisable sensation" of externality, and that, corollarily, the only proper basis for inference is this "personal artifice" derived directly from the "unsymbolisable sensation."

Now, let us revert to intellectualised, as distinct from sensed, distances of heavenly bodies. When, as astronomers, we intellectualise distances of heavenly bodies, we imagine "space" as equivalent to sensed reality, picturing in "space," as concepts, the geometrical figures which we can visualise, and apply as measures of concrete relationship, and assuming that what these figures enable us to demonstrate as terrestrial distances, applies to the heavenly bodies. As space is nothing apart from related objects, the analogy and premise are here fanciful. Then the conclusion is fanciful.

As we apply our visual impressions of relation-

ship, involving the picture of a spherical earth, to the heavens, there will obviously be correspondence between the map of the heavens and the map of the earth. Again, the concepts of time and space being applied to the heavenly bodies as we apply the concepts to concrete relationships, we are enabled to discover our terrestrial locality by comparing the astronomical with the geographical chart. Again, if our astronomical observation involves adequate induction, we shall be able to predict at what "time" certain "units of stimulus," as a particular heavenly body, will "appear," as "effective," and "disappear," as "ineffective" "units of consciousness" in ourselves. However, these corresponding contingencies do not affect the basical fallacy of the premises involving the conclusions and implying that time and space are entities equivalent to sensed objects.

Let me restate these propositions. We are unable sensorially to differentiate "effective" from "ineffective" "units" derived from heavenly bodies and constituting spatial relationship with ourselves, as we can differentiate such "units" as between terrestrial objects and ourselves. Accordingly, we sensorise these heavenly bodies as nearer or more distant, according to their apparent positions in the vault which, through geometrical visualisation, we conceive as the figure of the heavens. How distant these heavenly bodies are, we have no means of sensorially determining, because we have no available sensory criteria through which we determine the existence of distance itself. However, what we lack, as sensory

criteria, we fabricate in intellectualising celestial distances, as imagined analogies, based on treatment of "space" as equivalent to sensed reality. Applying our geometrical "personal artifice" to this "space," as we apply it to concrete relationships, we fabricate imagined criteria of distances (angles) for objects outside spatial relationship with ourselves, as equivalent to such criteria applied to objects within spatial relationship with ourselves. The conclusions we so attain do not involve inference from sensory experience, but involve inference from contingencies imagined as analogues of sensory experience. They are significant as showing the power of imagination to transcend sense-experience, and as applications to material ends, but are insignificant as real demonstration, or as philosophical elaboration of sensory experience.

It may be asked, is not a balloon above our heads within spatial relationship with ourselves? It is, so soon as we can determine its distance by acts of sensory apprehension; not, if we can only determine its distance by imagined lines in space. Practically, we may assert that a balloon, at any altitude within visual limits, is within spatial relationship with ourselves, because we do not test its relationship by imaginative criteria—lines in space,—but, by observing certain atmospheric effects, through various instruments (barometers, thermometers), and assuming, on the ground of empirical induction, that effects on these instruments, at sensed altitudes on earth, persist at unsensed altitudes. Here, our test of distance is empirically valid, and we bring the

balloon into spatial relationship with ourselves, just as we bring into such relationship the top of a mountain, through the same means. In such a case we do not verify by imagination, but by true inference from acts of sensory apprehension.

What astronomers really accomplish in compiling their maps, records of movements, positions, and dimensions, is to establish a constant system of concepts to which may be referred the varying actual experiences arising from our concrete relationships in space and time. Given certain original premises based on fictions corresponding to actual terrestrial excitants of our inherent geometrical proclivity for the circle as fundamental sensory percept, and applying these premises to adequate empirical induction, we necessarily get a system of conceptual truth corresponding, as imagined celestial phenomena, to our actual experiences of terrestrial phenomena. Applying the geometer's method of measuring angles within our sensory relationship, to what are beyond such relationship, will necessarily afford us a system of conceptual truth consistent with our actual experience, but such truth has no synthetic value as real inference from sensory experience. It merely fancifully restates sensory experience in terms transcending that experience, and is only really valuable as application to our sensual needs. If space is nothing but intersection, or differentiation of acts of sensory apprehension, what does it really matter if we can conceptually delude ourselves that space is an entity, and, through the delusion, attain the truth

that the sun is 93,080,000 miles away from the earth, and that the nearest fixed star is 270,000 times as far away as the sun? What use is it, apart from material application, to surge along towards the Nothing of infinite immensity on the one hand, or of infinite minuteness on the other hand, when all we really know of minuteness or immensity is what we can compare within sensory experience?

All mathematical dealing with spatial relationship is based on the hypostasis of space, and thus assumes that conceived spatial relationships are equivalent to perceived relationships. Thus, it virtually ignores what alone constitutes spatial relationship and becomes essentially but inference from imaginative data quite irrelevant to inference from known reality. When we assume the conclusions of such mathematics as equivalent to real demonstration, we revert to the savage's method of verification before he has learnt to eliminate imagination as verifying factor. If, adopting my standpoint, we refuse to accept as real premise for inference in the sensory arena what cannot be identified as sensed property, or what we call objects of sense, then nothing is definable in sensory terms except what can be identified by sense, and all inference involving sensory definitions of what cannot be so identified is philosophically spurious, though, as already indicated, it may be practically valid. It constitutes "fit" truth, only so long as we accept it subject to the reservations I indicate. So soon as we conceive an insensible line, we change the reality of the line as completely as we change

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the reality of the emotion, love, when we take the symbol as its equivalent. The *thing* is the sensory experience, or emotion itself, not the intellectual "echo," or concept, by which we represent it.

Let us now turn to the size of celestial bodies. Size or dimension is a symbol of property by which an object reveals itself to us. We again symbolise this property by various terms defining quality of spatial quantity (length, breadth, depth), spatial quantity itself (mile, yard, foot, inch). Symbols defining quality of spatial quantity represent lines of direction of acts of sensory apprehension perceived in combination as what we call shape or contour. Symbols defining spatial quantity represent arbitrarily isolated series of acts of sensory apprehension constituting units of measurement. In itself, any one of these symbols is essentially but empty sound. It only becomes a real thing so soon as it is applied to specific acts of sensory apprehension constituting a sensed relationship, or physical body or bodies.

The dimensions of the earth are ascertained by assuming it to be a globe and by applying to this globe the empirical fact that the circumference of a sensed circle is 3.14159 times its diameter. The heavens are considered one such globe of which we see the interior. Both globes are divided into 360 imaginary parts called degrees. By computing, through trigonometry, the distance from the zenith of a star, at two places on the same meridian of longitude whose distance from one another has been accurately measured by triangulation, astronomers

determine the length of a degree as variable, according to latitude, approximating to an average of 364,000 feet. Through determining the length of the degree, astronomers say that the equatorial diameter of the earth is 41,852,404 feet, and the polar diameter 41,709,790 feet.

The earth is assumed to be round, or of a shape approaching globular, for various empirically sound reasons: because sun, moon, and planets observable through telescopes appear round; because, in lunar eclipse, the earth's shadow is seen to be round; because, in the case of ships putting out to sea, first the hull, then the lower part of the rigging, and finally the tops of the masts disappear; because the horizon is circular. On the other hand, theoretically, the earth has been determined a variety of shapes very divergent from rotundity.

The determination of the size of the earth, like the determination of celestial distances, thus depends on dealing with space as an entity; the celestial sphere, really constituted by nothing but hypostasised space, being assumed as analogue of the spherical earth. Then, a star, assumed to be fixed in this imaginary celestial sphere, is taken as a vertical standard at two places at a known distance from one another, and triangulation is performed by imaginary lines in "space" to this star, as land surveyors imagine such lines in ordinary surveying. However, the land surveyor's lines are essentially different from the astronomer's, inasmuch as they are within conditions of spatial relationship between sensed

objects, while the astronomer's are outside such conditions. The space with which the surveyor deals is created by sensory percepts, as related bodily extensions. The space with which the astronomer deals is merely imagined, just as is the space of the physicist when he determines the distance between molecules. The immensity of the one, and the minuteness of the other determinations are practically infinite, and thus constitute what are really but symbols of acts of sensory apprehension (space and number), things in themselves. As already indicated, this involves the savage's method of accepting imagination as criterion of truth.

But, it may be urged, telescopes can sensibly reduce the apparent distance between us and celestial bodies, therefore these instruments show that the bodies are within spatial relationship with ourselves. I deny this. That the telescopes affect the "units of consciousness" we derive from the celestial bodies does not affect spatial relationship, but merely affords us an illusion of sense, just as would an appliance that could project, say, Mount Everest into the celestial vault. Whatever optical illusion we were able to excite regarding the mountain, it would remain within spatial relationship with ourselves, because a sequence of acts of sensory apprehension would connect it with ourselves whatever we effected by the appliance. The fact that we see an object, as in the case of a star, does not constitute the star within spatial relationship with ourselves, or does the fact that we are prevented from seeing, say, Mount

Everest, through being in England, eject the mountain from such relationship. Spatial relationship is only annihilated so soon as we have to imagine space as an entity, before we can establish spatial relationship. Spatial relationship is a matter of continuity of acts of sensory apprehension. There is always such continuity between us and terrestrial objects ; never between us and celestial bodies. To illustrate this—the land surveyor's method of judging distances involves the same apparent hypostatisation of space as the astronomer's. Really, the land surveyor's space is within sensed relationship. Though, *qua* space itself, his conclusions are just as peccable as the astronomer's, they become valid as practical application, because we can empirically verify his space as acts of sensory apprehension, just as we can so verify the space of an aeronaut who tells us what height he has attained. In both these cases, space is not really the criterion. This criterion is acts of sensory apprehension involving concrete relationships between us and the objects we observe. In the case of the astronomer, space is the only criterion, and his premises accordingly become, not inferential derivatives from sensory experience, but discrete substitutions imagined as identical with sensory experience.

All this applies in principle, as already shown, to the transcendental physicist's treatment of space, motion, time, energies. Light is merely fanciful hypostatisation of an interaction between ourselves and externality, constituting what we call light, a

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property or attribute of sensed bodies under special conditions, just as size, shape, colour, elasticity, rigidity are such properties. We can no more sensorially perceive light as an entity than we can perceive elasticity or colour. Physicists say we perceive colour through light. They might as well say we perceive light through colour. The light is just as much intrinsic to the body as is the colour. To show the body reflects or absorbs one or another sort of "ray," and so constitutes colour, is legitimate enough as practical theory, but failing proof of the real existence of the "rays" has no philosophical weight as proof that light is not what I have termed an emotion of the body, just as much a product of the body's interaction with other bodies and ourselves, as a fit of anger is a product of interaction between one and another person. We can no more really isolate the light, as an entity, than we can isolate the anger.

The truth about light and all similar conceptual entities is involved in my demonstrations of soul and units of stimulus and consciousness. Matter being ultimately these units, its interaction with ourselves involves that all we discover about it, as scientists, and all we do with it, as constructors, is the product of our soul's interaction with the God-soul. Phenomenally, there is nothing but the "soul" of matter and the soul of procreating beings. The matter-soul responding to the God-soul, interacts with our soul responding to the God-soul. This interaction we realise through the brain, as scientific

discovery, invention, mechanical construction, etc., which thus constitute fresh manifestations of the human soul's potentiality for interaction with the matter-soul. Thus, it is God who *does*, not we. When some sanguine people indulge vague hopes of solving the universe, they unconsciously imply that God will, some day, exhaust His capacity to afford humanity fresh problems and to gratify them by what are termed triumphs of the mind of man. The universe is a much bigger thing than these sanguine folk imagine.

Spectrum analysis of light all goes to prove that light is nothing in itself, but is merely a product of interaction between different states of concrete matter and ourselves. Were light a thing in itself, the fact of the distinct colour-impressions we receive from white light, "refracted" by the prism, would be inexplicable. Of course, once grant that white light is composed of different oscillations in the "ether," it is easy enough to say—and prove by the wave-theory—that the spectral tints represent particular oscillations separated from one another by the "refracting" glass. However, as the wave-theory begs the very points at issue—the existence of ether and a thing to produce oscillations, we must scrutinise the credentials of the wave-theory as real explanation. If that theory is merely a product of scientific eagerness to imagine analogies as equivalent to inference from sensory percepts, however completely it may justify its implications from its own premises, we must see what these premises are worth. I think I have proved in this work that the

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wave-theory will not satisfy philosophic requirements, inasmuch as neither ether nor light is a product of sensory perception, or of inference therefrom.

But, it may be urged, we can resolve sound into various elemental tones (harmonics), why should not light be analogously resolvable? I reply, assuming the resolution of sound as an entity (which point I shall presently consider), we cannot grant the analogy for the simple reason that we can sensorially identify air, but we cannot so identify ether. We can certainly imagine ether, but imagination is not to my purpose. I stand by the senses and inference therefrom, as my criterion of truth. I will leave imagined premises to mathematicians.

Now, as to sound. If I grant that certain aerial effects which we call motions involve what is called a tone, and that this tone is resolvable into certain sub-tones which we call harmonics, I still affirm that "sound" is nothing in itself, but is merely a product of interactions between concrete matter and ourselves; in other words, between "units of stimulus," as air, and "units of consciousness," as ourselves. I maintain, on the conditions, that not "sound," but sensation is "resolved," and that in talking about a tone and its harmonics we really objectify, through imagination, what is not objective.

What we sense as wave-motion in, say, an oscillating cord, or in liquid, is an interaction between ourselves and the cord or liquid, apart from any supposititious medium. When we see cord or liquid waves, we see the cord or liquid *itself* in a special

state of activity. Here we have clear sensory demonstration of interaction between ourselves and the cord or liquid, involving something we call wave-motion. Now let us turn to sound.

We can sensorially demonstrate that a gas is something akin to a liquid, as being elastic. Therefore we may imagine, but not infer, that waves occur in a gas analogous to those which we sense as occurring in a liquid. If, in the case of the gas, we assume imagination of its quality as warrant equal to that of our sense for the quality of the liquid, we may then say that our conclusion of wave-motion in the gas is established by a process of inference. But, inasmuch as our basis regarding the gas-waves is imaginative, all we infer from that basis is necessarily imaginative.

We can only assume that what we perceive as sound affords us experience of an undulating gas equivalent to what, as say water-waves, affords us experience of the undulating water. In the latter case we have genuine sensory experience of the water itself, as waves. But we have no such experience of the air itself, as waves. Between the water and ourselves there is direct revelation of interaction; we sense the water itself, as waves. Between the air and ourselves there is no such direct revelation of the air itself, as waves. We only suppose we so identify the air, through imagining that what we perceive as water, as waves, occurs in the case of air.

It will be seen that the credentials for the ear, as being an organ for the perception of air-waves, are

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very different from those of the eye, as being an organ for the perception of water-waves, and that, if we posit sound as being aerial motion, we are on very different ground from that we occupy in positing water-waves as being liquid motion. We can certainly sense air as an elastic medium, and we may reasonably imagine that waves exist in this medium, but we have none except imaginary warrant for positing sound *as* those waves. Accordingly, we have no philosophical warrant for implying that, as we see water as waves, therefore we hear air as waves.

On the other hand, as we cannot hear through a vacuum, we may philosophically posit that interaction between air, some concrete body and ourselves constitutes sound, just as we may posit that similar interaction constitutes light. Now, if we cannot allow the philosophical authenticity of the conventional notions of science regarding air-waves, it will be seen that we are very much further "in the clouds" when we speculate regarding ether and light. Here we have assumption piled on assumption. We first assume unsensed air-waves; then, on the basis of these hypothetical entities, we assume ether waves. Later, we shall probably have speculative science dealing with "waves" to constitute thought and a special ether for those waves. Once we start on the wings of imagination divorced from sense-experience, we soon reach intellectual fairy-land.

Now, let us consider this question in respect to solids and liquids. These act as media for sound, as do air, gases, and vapours generally. We can see or

feel movements in solids and liquids. The movements in these with which we are now concerned are called vibrations and oscillations. Let us take some illustrations. We can see a stretched string vibrate if we pull it sharply and then suddenly release the tension. If we hold a glass jar horizontally by the knob and sprinkle some fine powder on the side, on tapping the jar we shall see the powder agitated. Here we have direct sensory evidence of movement in bodies, and we have no real evidence of movement at all, except sensory evidence. Consequently we cannot infer movement in what we cannot sense as moving. We can sense no movement in gases and vapours except what we can see or feel as movement. Accordingly, we can sense no such movement as the physicist imagines as sonorous undulation. (Of course this applies to light.) We can only *imagine* this movement as *analogy* to what we perceive as movement.

Let me further illustrate this point. If we draw a bow across the prongs of a tuning-fork we see the prongs moving, but we cannot hear sound from the fork unless very close to it. If we dip the foot of the fork into a glass of water the sound becomes very perceptible, and may be much intensified by using, instead of the glass, a longish tube ending at the top in a funnel, and the whole filled with water and fixed at the bottom to a wooden support. The physicist tells us that the sound in this case is transmitted as vibrations of the water molecules passing to the wooden support through which we hear the sound. The only sensory proof we have of movement is in the tuning-fork. We

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only imagine there is something passing through the water analogous to what we see as the movement of the fork. Again, when we assume, as is done, that the liquid in the auditory labyrinth and the air in the auditory canal are set moving by the tuning-fork, we make a series of similarly imaginative assumptions that something called movement, or vibration, which we can only sense through sight or touch as a property of bodies under particular conditions exists in bodies which, so far as we can sense or infer from sensing, are in entirely different conditions affording us no real evidence of movement.

Of course, if we have excogitated a logical theory that sound is vibration transmitted by an elastic medium, and that solids, liquids, and gases constitute such medium, we may ascertain a number of truths about what we have excogitated, but this procedure is entirely distinct from inference from sensory experience. The scientific hypothesis regarding sound is true in regard to a premise imagined as analogue to what we can sense, as visible or tangible movement, but it is philosophically void as demonstration of the reality of what we call sound. From the philosophical standpoint only so soon as sound can be shown to be visible or tangible movement can it be movement at all, inasmuch as no movement exists that is not sensed or felt.

Hold a poker at one end and tap it at the other. You feel a vibration at the held end. Something has passed through the molecules of the poker, says the physicist ; and that something is motion. I say the

“motion” does not exist till I create it by feeling it, and consequently does not exist where I do not feel it. I only feel it where I grasp the poker, therefore the “motion” only exists there. I say that my feeling constitutes the motion, just as feeling constitutes the pain, if somebody strikes me with the poker. I say that my feeling the vibration and the pain is my experience of varied properties dependent on my interaction with the units of stimulus which I call a poker. When the vibrations and pain are not there, the poker, for me, has lost those properties, retaining others which I continue to sense—hardness, brightness, weight, which, so far as I am concerned and as I infer others to be concerned, are permanent poker-qualities.

But, it may be urged, if somebody else touches the poker between where I hold it and where I tap it, he also feels the vibration; therefore it is passing through the poker. I reply: necessarily he feels the vibration as I do, and thereby constitutes it. It is sheer assumption, based on hypostasis of symbols—motion and space—that a thing is passing through the poker. The interacting units of stimulus constituting the poker, myself, and the other person are the only things.

Similarly, if I stir the fire with the poker, what I hear is how I interact with the poker, grate, coal, and air. As I could not get poker-grate-coal interaction, as sound, in a vacuum, I infer that air, too, must here be a factor. The resulting sound is poker-grate-coal-air property qualifying all the sensed objects concerned in the interaction. If, as a physiologist

and morphologist, I involve the auditory apparatus and nervous system, then these too are interacting factors with the essential "Me," or soul, as are the poker, etc. Then, the sound is auditory-apparatus-nervous-system-poker-grate-coal-air property. (This argument applies to sight, touch, taste, smell, as it applies to hearing.)

Referring to the poker-tapping illustration, it may be urged against me : If two people stand apart and watch a moving train not simultaneously visible to both, the train has been moving between the two, why then has not vibration been proceeding through the poker ? I reply : Because the vibration only exists as my or the other person's interaction with the poker at specific points, whereas the moving train exists as a sensed thing of which one of its properties, *pro tem.*, is what I call movement. I here sense train-movement as attribute constituting, temporarily, the train itself ; but I do not sense poker-vibration as being poker-attribute in the same application of the term. I only sense the vibration as attribute constituting the one particular part of the poker I touch. The movement I conceive *in* the poker is a very different thing from that I perceive *of* the train. In the latter case, movement is really property constituting, temporarily, the train itself in interaction with other objects and myself ; but vibration is not, in the same sense, poker itself in interaction with other bodies and myself. It is merely, on the assumption of its passing through the poker, an imaginary entity which physicists call motion. I

utterly scout that there is any such entity in existence, outside imagination.

Again, it may be urged, why should not the poker be held to vibrate as does the stretched string, through which we perceive movement, as earlier indicated? I reply : In this case, movement is nothing except as our perception of it constituting it string-property as it constituted, in the other illustration, train-property. If we could perceive the vibration of the poker as a moving object in bulk, as we can perceive that of the string, then the former would be poker-quality, as the latter is string-quality. As it is, the poker vibration is merely movement tactually created, as interaction between me and a specific part of the poker. If I posit it at any other part than that I touch, it is not sensed or inferred from sense, but merely imagined, as analogy, say, to the vibration I see in the string, which only exists because I see it. Imagining and perceiving, or inferring from sense are, as I hope is now clear to the reader, very different things. Of course we can constitute movement by imagining it, just as we can so constitute the flying pig ; but pigs don't fly, nor does "motion" move. Only bodies or their parts move, and they move solely as our perception of movement as constituting their quality or property ; in other words, as *pro tem.*, the bodies themselves, or their parts. The idea of movement as being independent of our perceiving it is a product of the spurious ontology of physicists.

Professor Tyndall showed by a number of experiments how the effects we call reflection, refraction,

diffraction of light are paralleled in the case of sound. Thus, he showed how sound could be reflected by mirrors and refracted by thin balloons, equivalent to glass lenses. From my standpoint, such analogies go to support my contention that sound and light are interactions, not things in themselves—that all the “motions” occurring in connection with them are “motions” in our own sensations, and that there is no more real reason—apart from the conceptual hypostatisation of space by scientists, and their resulting theoretical systems—for postulating the transmission of light by ether than by air, or independently of both. As we cannot hear through what is called a vacuum, I will grant that air has something to do with sound, not as waves, but as manifesting matter-emotion through interaction with the particular sounding bodies, and affecting our soul through our nervous system so as to excite soul-fiats for the special sensations we call sounds. As anger is, for the time, to an observer, a property or attribute of the angry person—part of himself—so is sound a transient property of the body emitting it. It ceases to be such a property so soon as the body—otherwise in a condition to emit sound—is in a vacuum. Therefore, that we may perceive the sonorous property, it is necessary that the body shall interact with air. Conversely, we may say that sound is a property of air in interaction with a particularly conditioned body.

In the case of light, certain gases are necessary conditions for what we call combustion involving luminosity as a property of bodies. What we call

flame is luminous gas—the particular body itself in process of metamorphosis. An incandescent or dark hot body reveals itself to us by the light or heat, as well as by what we commonly consider its real self. As in the case of sound, the light and heat are properties constituting the body itself, and part of the conditions of the revelation is that the body interacts with, say, air. The light and heat are not things in themselves conveyed by a fanciful ether, or is the sound such a thing conveyed by air. The sound reaches us through air and takes an appreciable “time” to do so. This merely involves that a certain number of “ineffective” sonorous “units of stimulus” have to affect us before we experience “effective units of consciousness” involving an act of sensory apprehension of sound as a property of the body. This applies, as I shall later demonstrate in detail, to all properties constituting bodies—light, extension, density, etc. Nothing is really involved but matter-emotions and our soul-fiats for particular sensations. What we call weight, or the effect of gravity, as earlier indicated, is an emotion of matter, just as is light or sound, or heat. But while these latter are comparatively transient emotions of matter, weight is comparatively permanent. Still, as earlier indicated (pendulum experiment), weight is not an absolutely constant property. So far as we are concerned, the power of matter to reveal itself as special properties depends on the “effective units of consciousness” it can excite in us. These “units” are soul-fiats projected on the nervous system in response

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to excitation by that system. Everything we apprehend is a product of this "personal-artifice." We only know our own sensations.

The "ineffective units of consciousness" constituting what we call the time between the production of sound and our hearing it, do not involve a thing in "changing moments of rest," as does our perception of a sensed moving body. The sound is not within temporal relationship as is the body. If somebody fires a gun, and I, at a distance, hear the report, see the flash and time their respective appearances, neither light nor sound, as things, have been moving in temporal relationship, inasmuch as neither exists except as my interaction with the gun and explosive. If I cannot see the gun, I infer its existence. If I cannot see the flash, I cannot really infer its existence. This occurs because the gun is within spatial relationship, but the flash is not. This applies to the sound.

If somebody sees the flash between me and the gun, this implies no spatial relationship between the flash and the gun, inasmuch as only one of the factors, the gun, is within spatial relationship. There is no more spatial relationship between the flash and the gun than between, say, my starting and hearing the report. Assume the poker, in the tapping experiment, to be so long and blows so strong that a person touching between me at one end and the striker at the other, felt his vibration at a measurably different time as compared with my feeling the vibration, inasmuch as nothing is transmitted as "motion," and as temporal difference only exists as difference in

sensed movement, each of us would merely arbitrarily compare his particular sensation of vibration with actually sensed movements of bodies. But sensation, *qua* sensation, is out of temporal relationship. Therefore it cannot legitimately be compared with what is within that relationship. We can only say that my and the other person's vibrations take place at different times, by imagining that the sensations are equivalent to sensed relationships in space.

That the gun is, say, a "quarter of a mile" away means that certain "effective units of consciousness" involving what I call tactual experience, and consider the most perfect visual experience of the gun, occur subject to a number of other sensory experiences involved, say, in my walking past various objects, comparing my own movements with the fingers of a watch, and guessing how rapidly I have been moving. But, inasmuch as every sensory experience I get on the way to the gun is, itself, really out of temporal relationship, and is only brought within that relationship by imagination, as what is called memory, which affords a factitious semblance of reality, then, every sensory experience is essentially ever "present"; never "past" or "future."

Of course, as sensed relationship, the gun, flash, and sound are respectively separated by spatial and temporal intersections of acts of sensory apprehension. Concrete phenomena involving spatial and temporal relationship occur in connection with the flash and sound and gun. But the flash and sound are inherently not comparable with these concrete pheno-

mena. The flash and sound cannot be isolated in space and time, as can the permanent qualities constituting the gun or the powder as an object of sense. The flash and sound are emotions, or extra temporal and spatial attributes of the powder, as anger or geniality is such an attribute of myself. We can only bring the flash and sound into spatial and temporal relationship by arbitrarily and fancifully, not inferentially, nailing them to permanently sensed objects within spatial relationship. Only through the existence of such objects could we temporally compare our emotions and thoughts. If we try to think time between thoughts, we shall find it impossible. We can only temporally differentiate them by binding them, in fancy, to permanent objects of sense in spatial relationship. This applies to the flash and sound, as emotions or transient properties of the powder, air, etc.

Suppose I sit in a chair and say to a friend : Time me until I rise. Suppose that I mentally isolate myself from my material surroundings and the time question and devote myself solely to thinking. At last I automatically rise. I have had no sense of time, but my friend tells me I have been sitting an hour. So, I say I have been thinking an hour. But really, I have not been thinking in time. I only get time, in the connection by, as it were, nailing my thinking to my friend's watch. Then, I judge one thing by another totally different thing. So it is in the cases of the sound and flash. My hearing and seeing are here out of time as is my thinking. But I apply

time and space by nailing my hearing and seeing to specific intersections of acts of sensory apprehension involving what I call movement, or really, units of stimulus and consciousness constituting concrete bodies within spatial relationship. I no more see or hear in time and space than I think in time and space. What I do is to apply sensed movements of concrete bodies, as differentiated acts of sensory apprehension, to hearing and seeing, calling the differentiations time and space.

When I see bodies, as spatial extension, I mentally integrate differentiated acts of sensory apprehension. Then, the spatial extension exists within, not without "me." The bodies are only extended because my sensation is extended. The spatial attribute is in my sensation. So of temporal attribute—time, like space, is in the sensation. The sensation itself is out of time and space. When I sense walking "one hundred yards," or walking for "one minute," the time and space are quality of sensation, not of anything out of sensation. Time and space, as abstraction, are merely symbols, as is colour or taste. Neither colour nor flavour exists except as some specific visual or gustatory sensation. Neither time nor space exists except as some specific extensional sensation.

When I generalise visual or gustatory sensations as being colour or flavour, I am on quite different ground from that I occupy in defining a particular sensation as red or sour. In the latter case, I am really defining sensations. In the former case, I am merely conceptualising terms confounding all sensa-

tions of colour and flavour. So of space—when I say: this is a yard long, I define a specific sensation as extension. But, when I say: this occupies a yard of space, I define (as yard) a product of imagination (space) confounding all sensations of extension. A thing can no more occupy a yard of space than a yard of toothache.

Again, if I say that sound travels a certain number of feet in a second of time, I might as well say that space lasts a certain number of seconds in a foot of extension. Space only exists as specific sensation of extension, and sound only exists as specific sensation of tone. To assert that sound can travel in space is to assert that one specific sensation can travel in another. There is no space but specific extension, and there is no sound but specific tone. Again, there is no body but specific sensation of extension. If we say that *a* body is extension in space, we may say that *a* space is extension in body. This is what some mathematical transcendentalists implicitly affirm. They propound that space is the reality and body merely differentiations in it. There is really no more *a* body than *a* space. There is only some particular collection of attributes sensed together as an object on the one hand, or some particular collection of attributes sensed together as contour on the other. Body and space are merely symbols expressing things, not things themselves. The things are the specific sensations underlying the symbols. Of course we may metonymically apply these symbols as the things; but it is philosophically puerile to deal with the symbols, as does transcendental physics, as being really the things.

Now, let us return to spectrum analysis of light. By admitting light through a small hole and permitting it to fall on a prism, we get a band of colours. What does this mean? The scientist says it means that light is an entity in itself, composed of different constituents like an apple-dumpling. I say it means nothing of the sort. I say it means that the sun, air, prism, wall, and ourselves have so interacted as to produce a particular impression, which we call colours, just as, when I get a slap in the face, I get an impression which I call anger. The anger does not exist until the striker and I interact. Similarly, until the sun, air, prism, wall, and myself interact, the colours do not exist and, corollarily, light does not exist.

Let us see if we can here discover any empirical evidence for these propositions, that "bodies" not "energies" and "ethers" are the real factors. Were light such a factor, we should naturally suppose that, after coming millions of miles through the "ether," it would not permit such a trifle as a bit of glass to upset its constitution. Yet this light, when it enters the hole and penetrates the glass, becomes so utterly disorganised that instead of emerging in its normal state of so-called whiteness (really it is of no colour at all) it becomes red, orange, yellow, green, blue, indigo, and violet. Now, if light is something because it is white, we must consider it another thing when it becomes all these colours.

Still, it may be urged, it must be something because we can see it. I say we cannot see "it" any

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more than we can see "pain." It may be urged we see it as a beam penetrating the room. I say we do not see this "beam" any more than we see tooth-ache. We see particles of dust interacting with the sun. All we do is to feel an interaction between ourselves, the sun, the aperture, and the air. However, granting for the moment that we are able to establish the identity of the light by seeing the beam, how are we to prove that the spectral colours, altogether different from what we identify as the beam, are really that beam? Why shall we not say they are the prism or the wall? *Ex hypothesi*, the evidence for the existence of light is the visual effect which we call the beam. On the conditions we have no evidence for the light beyond this particular effect. Well, the colours are altogether different from the beam. Why is it more permissible to call the colours the beam than to call them the wall?

Why is the light, as the beam not intercepted by the prism, quite another thing from itself as intercepted? Suppose the prism alters light, why should the effect persist after the light has got free? One would not naturally suppose that a thing that had passed intact through millions of miles should not be able to recover its integrity perturbed by a fraction of an inch of glass. And why should a particular shape of glass ensure the disruption of the voyager, while another shape of glass does not affect it at all? Again, why shall different substances placed in the glass, as a hollow prism, totally alter the character of

the colour-band as coming through the glass itself? Why shall these substances, among themselves, totally differ in their resulting colour-bands? Surely these effects imply, to people not affected with undulation-on-the-brain, that light is non-existent, and that the real agents are the various substances, the sun, air, and ourselves.

Let us now consider something else. After we have cut up the light into its "rays," we can, by means of another arrangement of glass, re-combine the "rays" and restore "light" to its pristine "whiteness." This is advanced by ether-advocates as evidence that "light" is really cut up into "rays." To me it seems additional evidence that there was nothing to cut up except sensations. When we have two shapes of glass disintegrating and integrating an unsensed entity, I think we shall, as philosophers, exercise wise parsimony if we confine our attention to the glass and ourselves as the real factors at work.

By basing theories on imagined analogies, science becomes a mere process of refining concepts. From one series of infinitesimals and infinites to another the speculator wanders, until he is lost in intellectual *ewigkeit*. All he has achieved after his fearsome exploits among billions and trillions is to spin out his sensory "whipcord" into gossamer filaments, or twist it into giant cables. Philosophically considered, the transcendental scientist is merely a modern version of the speculator who ascertained how many angels could dance on the point of a needle!

CHAPTER VIII

MATERIALITY AND IMMATERIALITY

WE call sensed bodies material, and we call light and heat immaterial. We have empirical evidence, through Röntgen's discovery, virtually disproving that there is any essential difference between the material and immaterial, and confirming my inference, from the whole arena of science, that matter is essentially spiritual and reveals itself to us by what I may term a soul of its own. All the talk of physicists about matter as being inert, impenetrable stuff is, I may say, empirically disproved by the discovery of what are called the X-rays.

Our two senses of sight and touch have, until lately, sufficed to convince us that the most inalienable characters of bodies are bulk and density. The "X-rays" have already disposed of bulk as such a necessary character. That some other discovery will not similarly dispose of density, who shall say? Not I! Rather, I will anticipate such a discovery affecting the tactual sense in a way analogous to that in which the X-rays affect the visual sense. What

are these mysterious "rays" enabling us to upset all our preconceptions regarding bodies? Though, to a hasty view, these so-called rays are what we understand as invisible, in contradistinction to ordinary light, which we consider—erroneously, as I have shown—visible, the X-rays are really perceived, as a property constituent of bodies, as truly as are light rays. Through the interaction of matter, as what we call the electrical and other appliances originating the X-rays, we perceive them as apparent effects on (really, as property or attribute of) bodies, just as truly as we perceive light rays, arising through the interactions of, say, solar matter, or of incandescent carbon, as coal, as such apparent effects. However, while the light rays constitute, for us, visualised matter as what we call bulk, the X-rays constitute, for us, the particular matter as without bulk.

In the case of the X-rays, the process of interaction may be put in this way: Different metals, say, copper and zinc, responding to an acid, so affect two copper wires that another copper wire within, say, a silk and shellac covering, and under certain conditions of contiguity, responds to these primary wires by the effect which we call an induction current. Then, the terminals of the "insulated" system excite another response by highly attenuated gas in what we call a vacuum tube. This response we call luminosity. We respond to this "luminosity"—really to the excited gas and its envelope—by the sensation of vision. The result is that the tube and its contents interacting with, say, a human hand, involve what is

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called a radiograph of the hand, as the response to the hand of a sheet of paper, or glass coated with collodion or albumen, and as our response to the paper or glass. The hand which we see, under these conditions, has lost part of its bulk, as flesh. Did our visual conditions normally involve only such interactions as constitute the "light" of the X-rays, we should see our bodies only as skeletons. Then, we should probably consider as "visitation of God" what, to a man who visualised by ordinary light, would involve a human agent as, say, a murderer. The knife which, to the ordinary seer, would penetrate some vital part, to the abnormal seer, would not even touch the body. It occurs to me to suggest that such abnormal visual response, under what to ordinary seers are normal conditions, may occur pretty frequently and involve certain so-called occult phenomena of vision in which objects are perceived through conventionally considered opaque media. The visual organs would then discern under ordinary conditions of luminosity the effects which we usually perceive only through interaction with the electrical appliances—vacuum tube, etc.

I have above stated that the X-rays constitute matter as without bulk, so far as concerns the visual sense, and that we perceive the X-rays, as property constituting specific bodies, through the abolition of bulk, as truly as we perceive ordinary light, through the creation of bulk, as property constituting specific bodies. It may be urged that by this method of reasoning to analogy, we may say that we see dark-

ness, as property constituting bodies, through the abolition of bulk, just as, according to my hypothesis, we perceive the X-rays as such property. First, let me remark, in reply, that if we consider light as an entity in itself, darkness is, of course, merely the absence of light. On the other hand, if we consider light as a mode of interaction between us and bodies—an “emotion” of matter—then, though blackness is another such emotion, the mere stopping of the sensory avenues of sight, or the mechanical exclusion of light, involving what we call darkness, is essentially different from blackness.

In the one case (assuming light an entity), we have blackness and darkness merely the absence of visual perception of certain parts of an assumed entity, which parts we call luminous rays. In the other case, we have blackness a specific property or emotion of matter—just as is redness or bulk—and we have darkness simply the exclusion of visual interaction with a body among whose properties or emotions is what we call light. Thus, there is no real analogy between the mechanical obstruction of what we call light, involving darkness, and the abolition of bulk by the X-rays; but there is real analogy between bringing bulk into existence as emotion of matter, through what we call light, and abolishing bulk as emotion of matter, through what we call the X-rays. Here we displace certain matter (flesh) from the condition of bulk without affecting the bulk of immediately contiguous matter (bones). The latter matter then affects us by the emotion, bulk,

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while the former matter has lost the emotion, bulk, by which the bulk of the latter, under normal conditions, was prevented from affecting us as "effective units of consciousness." The X-rays thus transform what ordinary rays cause us to experience as "effective units of consciousness" involving bulk, into "ineffective units"; or, to picture by self-contradictory terms, unsensed bulk. By simply applying the X-rays to, and cutting them off from, our hand (that is, by interacting and ceasing to interact with the vacuum tube, etc.) we can visually annihilate and bring into visual existence the bulk of our own flesh and bones. Of course, we could do this by excluding and admitting what we call light; but we could not so annihilate the flesh and leave the bones visually intact. We thus get the real analogy that the bones which we do not ordinarily see in a hand are obscured by light, and the flesh that we ordinarily see as a hand is obscured by the X-rays, the one sort of "rays" thus acting conversely to the other.

Of course, I here talk of the rays as entities, merely for convenience of exposition. The rays are states of emotion of the various matter-systems and ourselves, in interaction. This applies to what I have termed the mechanical exclusion of light. By interposing what we call opaque and non-luminous media between ourselves and a luminous body, we bring ourselves into interaction with matter that responds to a luminous body by affording us the sensation of darkness. Then, the opaque and non-luminous matter obstructs for us interaction, as

“effective units of consciousness,” with the external luminous body, say the sun, and becomes what we term invisible, as do objects embraced by the obstructive matter. When we exclude “light” from a room, we exclude interaction with ourselves, of bodies, as “effective units of consciousness” of the visual order. The result is what we call invisibility. So far as regards the visual sense, we then annihilate matter.

What we know to exist, whether by sensory perception or by inference from it, constitutes for us all that does demonstrably exist. If we only imagine something to exist, it exists conceptually, but not as demonstrable reality. We do not really discover new constituents in the phenomena we call “nature”; we really, as so-called discoverers of new constituents of “nature” (take as illustration, argon, helium, the newly “discovered” constituents of the atmosphere), create these constituents by what I may term the hypnosis of matter, and experiencing fresh interactions with externality. To put the matter familiarly, we invent fresh constituents of “nature.” When Röntgen discovered the X-rays, the matter-soul so interacted with the God-soul, through our soul, as to involve an emotion of matter arousing a corresponding response through his brain, from the soul of the professor, involving what we call the discovery of the X-rays. The soul of matter, as “units of consciousness,” had no emotion constituting X-rays until the particular moment when the professor’s soul was caused so to interact with the matter-soul as to bring those X-rays into existence. After the

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interaction once occurred, it became what I may term stereotyped on humanity as a new empirical fact. Everybody then interacted as did the professor. To such points as this I shall frequently recur. Discovery and invention involve hypnotism by the human soul, through God, of the matter-soul.

All physical concepts of "conservation of energy," "indestructibility of matter," and so forth are, philosophically considered, puerilities. There is really nothing to "conserve" or "destroy" in the physicist's sense, inasmuch as there are no realities, but "units," or souls of "living" beings and "dead" matter. Of these realities, only the interactions can be perceived by physicists, and what these interactions involve, as revelations of energies, atoms, ethers *et hoc*, do not exist until somebody conceives them, and cease to exist so soon as nobody believes them to exist. What exists is only what we know as reality. As already shown, in discussing the nature of truth, we only know as the sensation we call belief, and, as I hope I have rendered clear, we can only rightly believe by inferring from sensory experience, and excluding imagination and emotion as factors in our belief. That normal sensory experience itself changes is illustrated by the X-rays, abolishing bulk. Knowledge is only sensation that changes. The *thing* of real moment to humanity is action conforming to the sensation, rather than the sensation itself.

What we call a luminous body is a body in such a state of emotion, or excitation, through the interaction of its "units of consciousness," as to afford

us, in interaction with that body, the sensation which we call light. Again, what we consider the natural shape or contour, involving bulk, of a body, is its "units" in interaction, so constituting what we perceive as the body : certain properties or attributes, of which shape or particularly conditioned bulk is one. What we call an incandescent body affords us the sensations of light and heat, as properties which modify or annihilate, as the case may be, the property of shaped bulk as we perceive it when the body is not in the state of incandescence. When, after a state of incandescence, a body previously sensed as of a definite shaped bulk becomes what we call gas, its "units"—as for us visual and tactual "ineffective units of consciousness"—affect us as being what we call impalpable, and—if the gas affords us no sensation of colour—invisible. Then, these "units" so interact that the property which we call shape is, for us, superseded by some other property involving that we perceive another emotion of matter. Still, when through effecting what we call combustion, we so change the effect of matter on ourselves that sensed shape becomes insensible gas, we only substitute one property for another, that is, one perception for another. The soul of the matter—as "units of consciousness"—is no more changed by our change of perception than our soul is changed by the matter, or than a hypnotic's soul is changed by the operator. The *things* are *in statu quo*; only the interactions are affected. Just as an emotion, say of love or hate, does not affect our soul as an entity, so the

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emotion of matter which we experience as, say, tangibility or intangibility does not affect the soul of matter.

We now hear some talk that a certain comet (either Tempel's or Biela's) will collide with and, according to Professor Falb, destroy the earth on November 13, 1899. As the comet, equally with the earth, is a product of our soul's interaction with the soul of matter, the destruction would simply mean change of interactions. Humanity's experience of properties would change, through the collision, just as, according to my hypothesis of post-terrestrial existence, every individual experience of properties changes at what we call death. If Professor Falb's prediction is to be verified, it will involve that humanity, *en bloc*, will enter on a post-terrestrial stage of evolutionary continuity. Nothing will be really destroyed, as *ens*; only interactions will change. To himself, the professor's prediction is truth, because I suppose he believes what he asserts. I do not believe his assertion; therefore, for me, humanity will continue its present experience of interaction after November 13. I do not believe the professor's assertions, because I reject his criterion of space as applicable to determination of what he forecasts. The comet is outside spatial relationship with ourselves. From my standpoint, if anything is to destroy the earth from outside spatial relationship, nobody will be able to forecast the event by the criterion of space. The only events within spatial relationship with ourselves which can be foretold

must be events arising from agencies within spatial relationship.

Foreseen events outside spatial relationship, but within empirical experience, as say, the sun's rising in the morning, or a comet's reappearance after a number of years, are not predictions in the sense I am now considering. Such events are inductive inferences from observation, quite distinct from predictions based on spatial contingencies applied to bodies outside spatial relationship with ourselves. If it were predicted that, on a certain day, the earth would drop into the sun, that prediction would be based on spatial contingencies. But when we say the sun will rise in the morning, we merely infer that as the sun has always, to our apprehension, so risen, it will continue to do so. In the one case, we have inference based on imaginative premises; in the other, inference based on sensory experience. We only know that the sun has gravity through the former sort of inference, and we have really no premises at all for inferring that Biela's comet has gravity. If gravity itself, as I have shown it to be, is not real, as inference from sensory experience, then a prediction on the score of gravity, that the earth will be destroyed by a comet, is no more philosophically significant than is a prophecy, say of the prophet Jeremiah, or Mother Shipton. What we call gravity, as already indicated, is emotion of matter—a product of our own response to matter. We know nothing of it, except imaginatively, as existing outside what is sensorially perceived. When we talk of celestial objects as having gravity

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and as going to annihilate the earth, we talk celestially, not terrestrially.

The X-rays empirically show that light is not a thing in itself, but is an emotion or property of matter which it manifests under particular conditions of interaction among its own "species" and with ourselves. Again, the X-rays empirically show that matter itself is what I shall later deal with in detail, as "units of stimulus and consciousness" constituting a soul for matter as what we consider dead stuff, as well as a soul for matter as what we call living. The real difference between these two sorts of souls I have already incidentally dealt with in considering biological questions and shall discuss completely in later chapters. All such infinitesimal restatements of the facts of sensed bulk and density as are involved in the physicist's concept of "atoms" are utterly foreign to true inference from sensory experience of the ultimate nature of matter. "Dead," or "living," matter is soul responding to God's will.

As our normal visual organs are unable to perceive the bones under the flesh of a hand, but as a particular responding system (the photographic paper) can "perceive" the bones, but, under the conditions of stimulation by the X-rays, fails to "perceive" the flesh which, under the stimulation of "light," we perceive, it is manifest that the perceptivity of any matter-system, whether it be a human brain or a photographic plate, affords no absolute criterion of perceptible objects. This is the necessary corollary of the demonstration that the photographic paper

“perceives,” on the conditions, what the human visual organs fail to perceive, and that, conversely, the visual organs, on the conditions, perceive what the photographic paper fails to “perceive.” That the paper really does perceive, in its way, as truly as we perceive, I shall later show.

Now if such variability in responsiveness may occur between our visual organs, a photographic plate, and what we call opaque matter, why may we not assume equal variability in respect to tactual perceptivity? What objective ground have we for assuming that our tactual sensibilities afford us any more real criteria of the density of matter than do our visual organs of its bulk? What is the objective value, philosophically considered, of our sensual differentiation between the material and immaterial? I maintain that our tactual is just as unreliable a criterion as is our visual sense, in respect to the essential quality of what we call concrete matter. Therefore, to talk of matter, in the sense of the Materialist, is, philosophically, romancing. Were our tactual perceptivities of matter modifiable by conditions such as those involved in the X-rays, we could practically annihilate our sensed world at will.

Let us now consider an illustration. Place your hand near a “live” coal. You feel something you call heat. I call that something coal, that is, part of the integration of “units of stimulus”—or, if we consider the coal as a responding system, “units of consciousness”—constituting a matter-system, or body, to which we apply the arbitrary symbol, coal.

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Why do you deny that this "heat" is coal? Because you cannot see the heat? But you can feel it. Why do you grant that the something you can see is coal, but deny that the something you can feel is also coal? You will perhaps reply: Because I can touch the something I can see, but cannot touch the something I feel as heat. This would involve the application of very arbitrary criteria. It would be equivalent to determining what is and what is not coal by the savage's method of determining what is and what is not matter. Why should the savage be wrong in his assumption that air is not matter, but you be right in your assumption that what you feel near the coal as heat is not as much coal as is what you can see when gazing at it, or as what you can feel when touching it? We have really no philosophical reason to deny that what we feel under conditions of what we term nearness to the coal is as much the manifestation of the coal's existence, and hence as much coal itself, as is what we see when looking at it and feel when handling it. If "seeing is believing," so is, under the circumstances, feeling believing, or it ought to be.

Why should we maintain that what we feel through our fingers is essentially different, as heat, from what it is as coal? Suppose we reply: Because we can grasp the one thing, but not the other. But we do not accept such a criterion when we decide about the reality of a gas. In this case, not only do we repudiate feeling as a guide to existence, we also repudiate touching as such a guide; not only are we

unable to grasp the gas, we are often unable even to feel it. Accordingly, on the hypothesis that our being able to grasp the coal determines its entity, we have less authentication of the entity of a gas than we have of heat, as constituent, or property of the entity we call coal. At least we can feel the heat as manifestation of the coal.

It may be asked : Why does not the above contention constitute heat an independent existence and contradict my contention that heat is merely an interaction? If feeling the heat is my warrant for asserting that it is really coal, why, it may be asked, shall not the mathematician who deals with heat and light as independent entities, turn my argument from feeling against my proposition that heat and light are not independent entities? Why, it may be asked, is not the sense-test as valid for establishing the independent existence of heat and light, as for establishing the independent existence of a sensed gas? The reply is : We posit the gas as a state of matter, whereas the physicist posits the heat as not matter. If we argue from sensory experience to establish real existence, we must show that the postulated entity, whatever it may be, is perceived by sense, *as* an independent existence. We can show that a gas is so perceived, but we cannot show that heat and light are so perceived. Heat and light cannot be sensed unless matter be interacting, whereas a gas is sensed as matter itself. Accordingly, if we assume heat and light (and corollarily, electricity, magnetism, or any other interaction dependent on

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matter) as insensible entities equivalent to what is sensed, we constitute, as already often emphasised, an imagined analogy as equivalent to a sensed percept.

It may be urged that we can estimate heat, as an independent existence, by means of various contrivances. I reply : So we can estimate what we call density or resistance as an independent existence, provided we elect to imagine it independent. Whatever we arbitrarily set aside as independent, we can estimate as independent. This does not involve that our arbitrary procedure has significance as real demonstration of independence. Again, it may be urged that our sensation of sight supports that of touch—say as regards the coal—but does not support that of the heat-sensation considered as coal itself. In reply, I ask, how do we know that our sensation of sight supports that of touch? I maintain we really know nothing of the sort. Of course we imagine the support, but we have no more real demonstration that sight confirms touch than that it confirms feeling. Sight and touch being habitually exercised concurrently on multitudinous objects, and the results of the application being habitually amalgamated in thought, we quite arbitrarily assume correspondence between two effects which are inherently not susceptible of comparison.

Let us take an illustration in regard to number, with which I have already dealt in an earlier chapter. Here we fabricate symmetry between sight and touch. We do not normally touch two objects and see one or three as what we touch. However, as already

indicated, the numbers are merely symbols qualifying acts of sensory apprehension, not as such acts themselves, but as concepts. That a seen object is conceived as "one" does not bring the actual percept into real connection with the object as touched and conceived as "one." The percepts, as acts of sensory apprehension, are different in kind, whatever concepts we apply to them. What we call "one" touched object is merely a particular act of sensory apprehension which we realise as "one" by perceiving differentiation, as spatial intersection, between it and other acts of the same type. But this differentiation does not bring it into true generic connection with the object seen as "one" any more than with the object seen as "two" or "three." The "one" as symbol of the touched object is not comparable with the "one" as symbol of the seen object, for the reason that the "one" in each case only exists, outside conceptualism, as property constituting the particular act of sensory apprehension. If one such act is essentially different from another, then each "one" as qualification of property is likewise essentially different.

Of course, we commonly consider the touched "one" and the seen "one," *qua* "one," as being identical. This occurs because we have so habituated ourselves to treating an abstract symbol of sensory quality as the real objective it qualifies that we have practically lost the ability to perceive the difference between symbolic and real existence and thus emulate the savage who takes an old bone wrapped in rags

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to be his sleeping ancestor. Naturally, on these conditions, we can touch, see, hear, smell, taste "one," "twenty," "fifty," and each "one," "twenty," "fifty" is identical with the other. This ability to confound is well illustrated in the case of some eccentric sensualists who have abnormal sense of what they misname colour, sound, flavour, scent. Thus, they say they smell colour, as perfume; hear colour, as tone, and so on. Such an eccentric says he can hear, say, a blue concord, a green discord; or smell a yellow perfume. The respective blues, greens, yellows of such an abnormal sensualist, whatever terms he may apply to them, would necessarily be different in kind to the respective sensations—only as which the colours exist—of him who could only see his colours, and it is obviously a stultification of language to distinguish auditory and olfactory sensations by the symbols representing visual sensations. Such misuse of language implies a reversion to primordial fused sensibility existing, we are led to suppose, as the primordium of the various sensory faculties. As chromatic differences only exist as visual difference, chromatic terminology cannot really define other sensory differences.

The above applies in the normal arena. He who sees an object as "one" has an experience different in kind, whatever terms he may apply to qualify it, from that he feels when hearing a tone as "one." The "one" of the visual sense is not at all the "one" of the auditory sense, though conceptually, through our habit of hypostasising concepts, the visual "one"

appears identical with the auditory "one." When we see *or* touch "one" book, the real definition is that we see *or* touch a "book-one." When we see *and* touch the book, the real definition is that we see *and* touch a book-two, inasmuch as there is here a sight-one + a touch-one which we arbitrarily amalgamate into one book. In conventionally considering the seen and touched book, we imagine that the tactual one is identical with the visual one as the eccentric sensualist imagines his smelt yellow is identical with his seen yellow. But we do not imagine our book-yellow is identical with our book-roughness. Really, there is as much difference between our touched one and our seen one as there is between our book-yellow and our book-roughness. The touched one and the seen one are as much different constituents of the one book as are the yellow and roughness. The touched one is as different from the seen one as the roughness is from the yellow.

There is really no essential difference between numerical and any other sensory differentiation. The "one" qualifies the book neither more nor less than does the "yellow" or "roughness." Certainly there are more things we qualify as "one" than as "yellow." Every sensory or intellectual experience we can differentiate we qualify as "one," but not as "yellow" or "roughness." Still the essence of each symbol is the same, constituting it, not a thing in itself, as a true objective, but a qualification of such thing. That one qualification is what we call

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conceptually abstract, while the other is what we call definitive, involves mere arbitrary differentiation. We can arbitrarily constitute "yellow" conceptually abstract, just as we can so constitute "one." Every verbal symbol of quality involves essentially the same abstraction, and in every case where we deal with such abstraction as a thing in itself, or true objective, we open the door for a multitude of falsities. The transcendentalism of the mathematical physicist is a case in point. His hypostasised numbers lead him into sad vagaries, as I have shown.

When I say : Here are fifty books, I differentiate an integration of book-impressions by a symbol. When I say : 500 men have passed me, I differentiate memories of men-impressions by a symbol. When I say : This is the second book in the row, I differentiate specific book-impressions by a symbol. When I say : This is the fiftieth book in the row, I differentiate one of a particular mnemonic integration of book-impressions by a symbol. In no case is the numerical symbol a real thing until the sense-impression is in evidence.

When I say : 1 plus 5 equals 6, I imply that one act of sensory apprehension, or one act of intellectual apprehension, or one act of emotional apprehension, plus an imagined integration which I qualify as 5, of other such acts, constitute another such integration which I qualify as 6. Apart from the implied acts, the symbols are essentially void of significance, though I imaginatively transpose to the symbols the real existence of the acts. Similarly, when I say :

Red plus blue equals red-blue, I imply that a blue object perceived with a red object will constitute impressions of blue and red. Apart from the implied objects, the symbols blue and red are as void of significance as are the numerical symbols under the like conditions.

Tactual and visual sensations are essentially distinct responses which we imaginatively combine through habit. The symmetry which we assume between them is a product of "personal artifice," not anything inherent to the respective sensations. Reverting to the earlier illustration, when we touch and look at the coal, the respective sensations no more really confirm one another in regard to the coal than they would do if we touched the coal while looking another way at another object. When we say we see and touch the coal, we imaginatively amalgamate two distinct sets of "effective units of consciousness" derived from externality, or "units of stimulus" constituting particular properties which we call coal. In the case of the heat, another set of "effective units of consciousness" constitutes another property that we sense as truly as coal as in the cases of touching and seeing it as bulk. Were the heat something essentially different from the coal, it would need to be perceived independently of a material source, that is, independently of sensed properties as its necessary antecedent. Heat is never so perceived. Therefore heat is not a thing in itself, but is a property of such a thing.

What we call the properties of matter, or bodies,

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are really "units of stimulus" exciting in us "effective units of consciousness," as tactual, visual, auditory, gustatory, olfactory sensations. These latter constitute for us the properties, or bodies. The "units of stimulus" are the reality of matter behind these sensory presentations which I may term emblems of the reality. We only know the reality through inference from these emblems. We know the emblems through immediate intuition. Inference from sensory experience enables us to transcend the sensory experience. Imaginative attenuation of sensory experience, as in the case of atoms, energies, ethers, merely enables us to substitute conceptual for sensory premises. Concepts are only valid in the philosophy of science so far as they are bound to sensory intuition, either as definition or as inference. We make no real advance through the imaginative attenuations of speculative physics. God, soul, morality are only revealed by the philosophical method of inference. The concepts of science, as conventionally expounded, necessarily begin and end as they begin, in sensory experience. The concepts of philosophy of the sort with which I am now concerned begin in sensory experience and eventuate in spiritual demonstrations.

Let us assume that two men exist with the same sense of touch but with different visual perceptivities as involving magnitude. Let both close their eyes and handle an unfamiliar object. They would perceive it as of the same resistance, or what we call size and contour. Then let both look at it. They

would perceive it as of different sizes. Here, the sight of either would not correspond with the touch of the other, and the sight of one would not correspond with his touch measured by the touch of the other which, *ex hypothesi*, is the same as his own. Though each would imagine that his visual and tactual senses corresponded, something touched by both would not be seen by one of them. Accordingly, if the existence of the object be verified by touch supported by sight, some part of that object would necessarily be annihilated to one of the observers. He who supported his sense of touch by the comparatively magnifying sight would visually perceive more matter than would the other; still, both would sensorise from the same "units of stimulus" constituting the particular body. The difference would be that one would visually utilise more "effective units of consciousness" than would the other, that is, the same "units of stimulus" would differently affect the two observers in regard to visualisation, but not in regard to touch.

Thus, we may rationally argue that there is no essential connection between touch and sight, or between any sense-perceptivities; each is independent in itself, though all, through habit, are conceptually amalgamated. Each sense verifies for itself, though through conceptual habit we are led to the assumption that there is some objective connection between them. Of course, the possibility of this conceptual habit needs philosophical interpretation. This I shall later supply in dealing with the metaphysics of mind,

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and have already indicated by anticipation in various incidental arguments in earlier chapters.

Let us suppose that we have so transcended our present methods of sensory verification that we do not habitually judge objects by touch and sight, but by feeling and sight. Then, though we visualised as we now do, we might intellectualise the size of an object according to the area through which we could feel it. Taking the coal-illustration, what we call the heat from it would affect us as analogue of what we call its density or resistance. Feeling would then supplement sight, as under normal conditions does touch. Then, the coal would appear smaller and smaller (besides manifesting other changes) according to its loss of heat, as conversely a snow-ball now appears larger and larger as we roll it in the snow. Further to illustrate this independence between sensory experiences, I may instance an illusion of touch first advanced by Aristotle. Place a pea between the crossed first and second fingers. Then roll it about. You will tactually perceive two peas; but you will not also visualise two peas. Here is another illustration. When skin is taken say from the forehead and planted on the nose, the patient for a long time mentally perceives excitation of the nose through the transplanted skin, as though his forehead were affected. Yet he does not so visualise the excitation.

It may be urged, not only physiological systems perceive the difference between the tangible and intangible; what we call inorganic matter also per-

ceives the difference. Thus, the effect of throwing a brick against a window-pane is very different from that of throwing an india-rubber bag filled with air, or trying to force a handful of air against the window. The impalpable gas constituting the one projectile is very different from the dense clay constituting the other, and the shattered glass testifies to this difference as conclusively as do our own sensations when we test by touch and sight.

We know nothing about the glass, brick, or bag, except as our own sensations or inference therefrom. We really do not know how the glass responds. All we know are our own "effective units of consciousness" or sensations derived from properties we call glass under particular conditions with regard to other sensations derived from properties which we call brick, gas, etc. Thus, we know nothing about the responses of matter to matter except by imputing to matter analogues of our own sensations involved in what we consider those responses. All that we are really dealing with, in the case of the bag, brick, glass, are our own sensations, or effective "units." When we say the glass perceives differently under the respective conditions, we really imply that we hypnotise the matter-soul into affording us the respective sensations which we objectify, attributing them to the glass.

Accepting as given this imaginary transposition of our own sensation to the glass, that we respond differently to the glass according as a brick or the bag is the missile may be said to involve inference

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that the glass responds differently to the clay and air. Then, we may of course say the glass perceives the air and brick as we do, but this has really nothing to do with the question at issue—the essential immateriality of matter. We do not decide this question by our own sensations any more than by those of glass. This question is only to be decided by *inference* from our sensations, involving philosophical synthesis from the whole arena of science. We have to test the reality of our own sensations, which are really all we know of the “sensations” of the glass, and are accordingly the sensations themselves of the glass, inasmuch as we can know no sensation but our own. The false implication of common method and of the method of science is that we can know other than our own sensation. Of course only through accepting this inherently false implication are science and common activity practicable. Still, when we apply the philosophical method, we must be careful not to ignore the provisional nature, as verification, of this imaginary externalisation of our own sensations. As philosophers, we must always remember that the savage’s method of accepting imagination as criterion of truth is no longer tolerable, and that the only genuine criterion is intellect applied to sensory intuition.

Ignoring these points, let me now try to meet the assumed contention from the conventional standpoint. We will, for the moment, consider as real entities electricity and sound. An electric shock is as able to knock a man down as is the brick as a

projectile. Moreover, the immediate sensorial effects on the man, whether he be felled by the brick or the shock, may be assumed as practically identical. Let us suppose that through some visual abnormality such as that considered in the case of the X-rays, or through the brick's striking us from behind, we are prevented from seeing it. Then, whether the shock or blow came from the brick or from the electricity would be, so far as regards our sensorial perceptivity, an indeterminate matter. In other words, the palpability of the electricity would then be as determinate to us as is the palpability of the brick. But, it may be urged, the electricity does not fracture glass as does the brick. Assuming it does not, let us see whether any other supposed impalpable entity will produce the fracture. Physicists tell us that sound is such an entity capable of fracturing glass. That is tantamount to telling us that could we throw a handful of air as effectively as we can the brick, or as a little dynamite can "throw" air, we should render our handful of air as effective as a projectile as is the brick.

Now, let us apply another illustration. We can walk through an indefinite thickness of still air, but we cannot walk through an inch thickness of deal planking. Still, if we have tried to walk against a hurricane we shall find the air quite as effective a barrier as is the wood. But, it may be urged, the air, in such a case, is in rapid movement. Assuming the reality of this movement (I show that it is essentially unreal) the effect merely involves that different

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states of air give us different impressions of solidity or resistance. Well, if we measure the quality of air, as solid or impalpable, according to its states of rest (constituting what we call movement), why shall we not similarly measure the wood? Let us try to walk through the wood in the state of changing "moments of rest," as smoke; then we shall find it as impalpable as is the still air. That we visually perceive the wood as smoke, as something different from the wood as a plank, but cannot visually perceive similar difference between air at rest and air as a hurricane, is merely a matter of subjective limitations conditioning possible sensation. When we visually perceive the wood as smoke, its "units of stimulus" afford us more "effective units of consciousness," giving us the impression of spatial extension; when, through our tactual organs, we try to perceive it as smoke, it then affords us no "effective units of consciousness," giving us the sensation of density. We have then no tactual "effectives"; all have become "ineffectives." Accordingly, to our tactual sense, the wood has become non-existent—what we have sensorially gained, as spatial extension, we have lost as density or resistance.

It may be urged that the arguments here advanced imply that we have first-hand knowledge only through the sense-organs and general sensibility involving what we call feeling, and that conceptual knowledge, so far as it is real, must emanate from sensory knowledge. I affirm this proposition in its entirety. I assert that all our knowledge is founded on sense-

perceptivity, and that we have no ground for postulating as real, in regard to physical phenomena, what is not perceived by the sense-organs, or what does not logically arise, as inference, from what we so perceive. It may be urged that this is tantamount to affirming the reality of objects, *as* we perceive them by sense. I reply that so long as men had no means of transcending sense-experience by logical inference therefrom, such sense-experience involved real and final knowledge of externality, and that objects did, under such conditions of knowledge, really exist as perceived. This is, indeed, a truism, granting my demonstration that truth is only what we believe. As nobody, on the conditions, was able to attain belief that objects were other than as presented by sense, these objects were then none other.

On the other hand, I show in this work that objects do not now exist, in ultimate reality, as pictured by sense, because we have a previously unavailable means of inferentially transcending the experience of sense, not, as already indicated, by the spurious method of imagining analogies to products of sense-experience as in the case of transcendental physics.

Referring to the above argument regarding heat and coal, it may be urged that if the heat is coal, physical pain may be considered as constituting an object affording us the experience of such pain, and that this applies to any physical sensation we may derive from any object—that inasmuch as heat, *ex hypothesi*, is no more sensed, apart from the

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object, than is pain or any other externally derived physical sensation, we have no better logical ground for denying pain, etc., than heat as part of the particular object. I assert that we have no better philosophical ground for isolating heat, etc., than pain, as entity apart from the "units of stimulus" constituting what we call objects of sense, affording the respective sensations, and the "units of consciousness" constituting ourselves, as percipient entities. The heat, like the pain, is purely a product of interaction between ourselves and the particular object, just as is colour, density, bulk, flavour, etc., each constituting part of an experience, *sui generis*, which we call an object of sense, separated in our consciousness from other objects similarly constituted of perceived qualities.

So soon as we want to identify what underlies the sensed qualities, as deeper reality than they, we must, as I show in this work, project ourselves into philosophical transcendentalism, involving the "units" I demonstrate. These "units" being, as I show, necessary resultants of inference from to beyond sense—not mere imagined analogies of what we perceive by sense, as in the case of atoms, ethers, etc.—cannot be verified or defined in terms we apply to sensed objects. Still, we can no more rationally deny their existence than we can deny the conclusion of our senses.

When we feel a blow from a stick there is a certain quality of the stick (as analogy to which we may take the physicist's "potential," etc., "energies") under

its transient conditions. This quality we call pain, just as we call other qualities colour, hardness, etc. These latter we recognise as more permanent qualities than is pain. Accordingly, we judge the existence of the stick by these permanent qualities. Still, when the stick affords us pain, its entity is constituted of something more than its permanent qualities. But, it may be urged, we only feel pain as quality of the stick, so long as the stick is conditioned by another agent, say an arm wielding the stick. Why then, it may be asked, shall we consider pain a quality of the stick rather than of the arm? Why should we consider this pain, in respect to stick-quality, as in any way analogous to, say, colour? Let us deal with the latter question first. The answer to that is: The stick involves colour, subject to contingencies, just as it involves pain. The contingencies (interaction with a luminous body) involving colour are really different in the connection from those involving pain, only to the extent that we can less readily imagine them separate from the stick. We can indifferently apply the pain to the stick or the arm as agent, but we cannot so apply the colour indifferently to the stick, or the multitudinous contingencies involving the colour, so we arbitrarily isolate the pain as quality distinct from the stick, while we assert that the colour constitutes, with other qualities, the stick itself.

The agencies endowing the stick with colour are not essentially different (as constituting colour a quality of the stick) from the agent (the arm) con-

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stituting the pain, another quality of the stick. So long as the stick involves pain, pain is a quality of the stick, and as we only sense the stick as qualities, pain is, *pro tem.*, constituent of stick. Of course, if we like to go further back, pain is also, on the conditions, arm-quality ; or, still further back, sun-quality ; or, again further back, not God-quality, but quality proceeding from God. What causes cannot be what is caused. God, as the only real cause, is the ultimate of our analysis of qualities.

The foregoing references to sense-impressions and feelings (colour, pain, etc.), as being temporary or permanent constituents of objects, as already indicated, presuppose these qualities as *potentialities* for the respective manifestations which, as actual sense-impressions and feelings, only exist in ourselves as products of excitation by whatever may constitute the *ens*, or reality of the particular object under its own conditions of excitation. The pain, colour, etc., only exist in ourselves, as manifestations, subject to their being in the object, as some state constituting excitation with regard to ourselves. Whatever this state of the object, as excitant may be, it must involve something we conceive as spirituality—the antithesis to what we perceive as materiality. The object that excites us must itself be excited, and this fact of its excitability must constitute it a spiritual entity, as opposed to the mechanical conception of “inert mass.” The qualities, inertia, density, etc., that we perceive as constituting “matter,” are as much in ourselves as in the “matter.” They do not con-

stitute the underlying reality of "matter" any more than our own body constitutes the underlying reality of our own entity.

The points above advanced will be further elucidated when I come to deal specifically with my own hypothesis of "units" to which I am leading the reader by various ancillary discussions. Having shown how we now transcend sense-experience, I will conclude this chapter with a few more remarks regarding the fundamental validity of that experience.

Pain and pleasure, in the æsthetic and moral spheres, are evolutionary developments of sensed experiences. As physical pain or pleasure is a qualitative constituent of the sensed object exciting the experience, so is psychical pain or pleasure a qualitative constituent of such an object, or of activities evolutionally arising from experience of sensed objects. When we æsthetically appreciate a work of art, we start the process by assimilating qualities of matter (really spirit) "fashioned," that is impressed with qualities not inherent to itself, by human spirit. We must see the written or printed page, sculptured stone, painted canvas; hear musical instruments, before our æsthetic apprehension, as responding subjects, can operate. On the other hand, the poet, sculptor, painter, musician themselves may feel æsthetically, independently of direct sensory excitants. Still, they only so feel because they can realise by imagination, based on memory, the sensory stimuli. Habit enables the creative artist apparently to be

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oblivious of sensory excitation. Still, this is the basis of his "inspiration." Spoken language, which we have projected so far beyond the realm of sense, and which we automatically use independently of sensory perceptivity, is built on perception of qualities as sensed objects.

Again, moral sensibility could only come to manifestation as a superstructure on sensed interaction with externality. Before we knew moral good and bad, we had to sense bodies in specific states of activity. When we say, an action is good or bad, we apprehend qualities involving pain or pleasure, as specific physical manifestations, essentially as we do when we say velvet is soft. So in art—when we say : This is beautiful ; or in science or philosophy—when we say : This is true, we directly or indirectly presuppose quality as physical manifestation. The artist, scientist, philosopher can only feel their truths by feeling qualities as sensed objects. Even the introspective transcendentalist who begins his edifice from the pinnacle, instead of from the foundation, can only imagine his "categories," "forms," and what not, through accepting as given the testimony of his senses. All intuition, to be profitable for these days, must accept as its basical premise, the verdict of sense. Logically proceeding from this basis, it may then reach the empyrean of transcendental truth—the great desideratum, through the extinction of emotional belief, for modern civilisation.

In later dealing specifically with soul, I shall demonstrate how the human body, not soul, directly

interacts with externality, so constituting thought, sensation, emotion. Similarly, in regard to the inorganic, it is the "body," not "soul" of "matter" that interacts and so becomes, for us, the various objects affecting our sensory experience. Reverting to the stick-illustration, the stick's "soul" is its essential "self," as our soul is our essential self. The stick's "soul" is the spiritual substratum of "matter" under specific conditions of external excitation involving, for us, the stick "body." The specific conditions of the "soul" of "matter" also limit it, in the case of the stick, as stick "soul," or "material." As I shall later show, and have already partly demonstrated, the organic soul is not limited or differentiated, as in the case of the inorganic "soul" or "material," by external conditions, but by what biologists demonstrate as hereditary determinism, or what I metaphysically demonstrate as procreative soul-fiat.

While we can sensorially identify this specially conditioned "matter," as a stick, we cannot sensorially identify the real essence, or what metaphysicians call "material" and I call "soul" of the stick. We can only sensorially identify its interacting factor, or "body," just as we can only sensorially identify our own interacting factor, or body. If we are to identify our own, or the stick's "material," or "soul," we must apply a faculty later evolved than sense—intellect, to inferring from, to beyond, what we sensorially identify as body. Ultimately, the conditions involving the differentiation of the "soul"

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of "matter" into the specific "material," or "soul" of the stick, are the same as those involving the existence of any individual human or brute soul. These conditions are—God's will. However, while the soul of matter has no individuality apart from our interaction with it, the human soul has individuality independently of interaction. How far such individuality applies to organisms not human, I shall investigate later.

The sub-individuality that pertains to the matter-soul, as the substratum or material underlying individual bodies, and through interacting with which we bring the bodies into sensed existence as properties, is what our soul, under God's will or hypnotism, produces, as hypnotism, in the matter-soul. This point will be further dealt with in the following chapters.

CHAPTER IX

THE VALIDITY OF SCIENCE

ACCORDING to modern science, which implicitly discards the earlier mechanical notions of "mass" and "motion," as discrete entities constituting "matter," "matter" is, ultimately, immateriality, or "centres of force," essentially equivalent to what I propound as "units of stimulus and consciousness." On the other hand, science illogically discriminates between its "centres of force" and something it imagines as "energy." This "energy," according to the implication of science, emanates, as a factor overcoming what science calls resistance, from "matter." So, according to science, we have, first, "centres of force"; then, we have another sort of "force," called "energy," emanating from these "centres of force," though never affecting their integrity. In other words, though these "centres of force" are ever giving out something, they are "indestructible."

Obviously, the above propositions involve transcendentalism. If "centres of force" give out something real, as "energy," without affecting their own

integrity, the "centres of force" must be endowed with what we call supernatural attributes, inasmuch as nothing within the range of the conventionally "natural" can be a source of something without either losing its original integrity or being itself replenished by some external factor. In other words, science compels us to attribute a "soul" to "dead," just as science compels us to attribute a soul to "living" "matter." Without such "soul," we can no more account for the "energy" of inorganic, than we can account for the "life" of organic "matter." The "energy" is the manifestation of the "life" of the inorganic, as the sensory, psychical, etc., activities are the manifestation of the "life" of the organic "matter."

Science isolates this "energy" from its "body," or "matter," calling the "energy" heat, light, electricity, magnetism, etc., and applying various subjective tests to this isolated "energy"; but science does not so isolate and test the manifestations of a physiological organism, as though those manifestations were themselves entities apart from the organism. Why does science make this distinction between the manifestations of "living" and "dead" "matter"? I reply: Because science is under the illusion that it is dealing with objective entities in the one case, but is under no such illusion in the other case. In the one case, science externalises the products of "personal artifice" (to be later dealt with specifically), while, in the other case, science treats these products, logically, as what they

are—phenomena of nervous responsiveness to external stimulus. Thus, as we commonly isolate in imagination the scent of a flower, as an entity apart from the flower, so does science isolate what it calls “energy” from “matter.” Then, science deals with its own subjective artifice involving imaginary differentiation between the reactions of the “body” of “matter” to its “soul” and the effects those reactions produce on ourselves, in a way quite different from its dealing with this subjective artifice when it involves the manifestations of our own organism. Just as we commonly say this or that scent is agreeable or disagreeable, or this or that action is admirable or the reverse, so does the scientist say “light” travels at the rate of 185,157 “miles” in a “second” of “time,” or that “actions and reactions are equal and opposite,” or that “a current of electricity is directly proportional to the electromotive force and inversely proportional to the resistance of the circuit.”

Such assertions as the above are quite satisfactory as what is conventionally called science; in other words, they are conclusively proved as subjective ratiocination, just as is a mathematical demonstration; but they do not carry us anywhere near the ultimates of objective inference, or what I may term the root of things. They reveal nothing of the causation behind our sensory apprehension of effects; yet, on the basis of such subjective empiricism, a number of people deny that there *is* causation, and through the promulgation of their superficial conclusions involve

consequences adverse to the most vital interests of humanity.

I have suggested that in the "lowest" type of organism, the animal is in the biological, though not metaphysical application, all soul—that is, there is no distinction between soul (germ-plasm) and body (soma). Similarly, the inorganic matter-system is beneath our sensed experience of it, as body, all soul, or what I have termed units of stimulus and consciousness. All the forms of "energy" dealt with by physics are, from my standpoint, the effects of interactions between our soul and these "units" so affecting our sensibility as to call forth the various visual, tactual, and auditory impressions which, through the geometrical mentalisation inherent to humanity, are elaborated into the mathematical concepts of physicists. Thus, when we say, in connection with "light," that "the angle of reflection is equal to the angle of incidence," we are dealing, not with a real objective entity (in "radiant energy"), but merely with our own inherent limitations of sense-perceptivity. In other words, we are then applying to an imaginative abstract certain laws of our own subjectivity, not of the object we imagine we are investigating. Then, we deal with "light" as the psychologist deals with mind, when he wanders in the mazes of verbal distinctions between various manifestations of mind. In both cases, we are merely investigating our own subjectivity, instead of the "thing itself."

This method is adequate, so long as its applica-

tion is merely to issues, within the arena of our sensory empiricism, or to imagined analogies of such empiricism. Thus, it enables us to imagine we discover that the earth is not flat—that it revolves about the sun. It enables us imaginatively to measure planetary bulks and distances; to discover new applications of an imaginary “energy.” In innumerable ways it adds to our sensual gratification. However, all such processes are essentially foreign to genuine objective investigation. For instance, Dr. Hertz of Carlsruhe discovered that electrical oscillations, like light undulations, are propagated in space, and Signor Marconi has applied the discovery (and that of another investigator, Mr. S. A. Varley, relating to the peculiar effect of an electric current on certain loose powders of carbon and metals, as “conductors”) in his invention of the wireless telegraph. But neither Dr. Hertz’s discovery nor Signor Marconi’s application shows that “electrical oscillations” exist outside our subjectivity. The same “personal artifice” involving Hertz’s discovery also involves perceptivity of the Morse signals through Marconi’s apparatus. Necessarily, as we are organised on a plan involving conceptual symmetry in our perceptivities, the one state of perceptivity conforms with the other—that is to say, assuming Hertz’s perception of the “oscillations” was valid, as human interaction with the matter-soul destined to become scientific truth, so soon as Marconi invented a transmitter and a receiver which, respectively, would propagate and record the “oscilla-

tions," the normal "personal artifice" which involved, to Hertz, perception of the "oscillations," would be corroborated by like normal "personal artifice" involving perception of the Marconi signals. But this does not demonstrate the objective existence, as ultimate realities, of "electrical oscillations," any more than the phonographic reproduction of vocal sounds demonstrates such objective existence of sound, as perceived by "personal artifice." We are still dealing equally with "personal artifice," whether we consider sound as the issue of "aerial waves," or as the common sensory experience ("noise"). Similarly, we are still equally dealing with "personal artifice," whether we crudely talk of a "shock" of electricity, or talk scientifically of "electrical oscillations." Our notion of "oscillations" is just as subjective as is our notion of "shock." Neither helps us nearer the objectively real.

Again, let us take the law of "conservation of mass," which is the foundation of chemistry. The law states that the mass (weight) of matter, at the end of any series of changes, is the same as it was before those changes started. In other words, this law posits the indestructibility, and, if I may coin a term, the uncreatableness of "matter." The law is the outcome of chemical analysis and synthesis—of observation. Should observation ever show that the mass of matter, at the end of a series of changes, was different from the mass before those changes started, the induction would fall and with it the law. I so firmly accept the law of conservation of mass

that I believe no exception from it will be discovered by chemists or physicists, so long as human intellect is conditioned as it now is. But this I believe, not because I believe that "mass," as the chemist conceives it, exists as reality outside ourselves, but because I believe in the persistence of the particular subjective state involving the particular scientific conclusion. The subjective state, not the "mass," is, from my standpoint, the objective reality which is "conserved." I assert that observation must always confirm the "law" of conservation of "mass," for the same reason that I assert that observation must always confirm the "law" that "twice two is four"; not because I believe that "two," "four," and "mass" represent "things in themselves," but because I believe that "two," "four," and "mass" are products of personal artifice that cannot change so long as humanity is under its present conditions of limitation by soul-fiats. In other words, I believe scientific and empirical "laws," not because I believe they are laws of things apart from ourselves, but because I believe the laws are of our own subjectivity; in other words, laws of thought, or soul-fiat.

Nevertheless, what is now a law of thought, in the shape of phenomenal reality, may, through the advent of soul-fiats involving new products of personal artifice, or what we call fresh observations and inferences therefrom, prove to be no longer a law of thought. Thus, there was once a law of thought involving, as phenomenal reality, that the earth was flat and the stars small bodies spread above it.

Later, this supposed phenomenal reality was obliterated by another revelation of law of thought involving, as phenomenal reality, that the earth is a spheroid flattened at the Poles, and comparable to an orange. Still, a later law of thought told us that the earth was not a spheroid flattened at the Poles, but an ellipsoid flattened at the Equator as well as at the Poles. Still later comes another law of thought telling us that there is good reason to suppose that the earth is not even an ellipsoid, but, in the words of Dr. Gregory, is "shaped like a badly-made peg-top," or, according to Professor Darwin, more like a potato than an orange. "Moreover," says Dr. Gregory, "there is evidence to show that the earth's figure is still more irregular than that of a peg-top, and that its shape had undergone a series of deformations." Who shall say that laws of thought shall not some day force us to believe again that the earth is flat, or shall not obliterate the law of conservation of mass? As I have often insisted, what we believe is a trifling matter, so long as we *do* believe and act *as* we believe.

Such changes of belief as those I have suggested as possible would involve change from our present conditions of limitation by soul-fiat to other conditions of such limitation, just as does obliteration of the belief in ghosts when the belief is demolished by belief in the explanation of ghosts as being spectral hallucinations, or illusions. When the once-superstitious person renounces his belief in ghosts and adopts belief in their origin from his own imagination, he experiences essentially the same

change of law of personal artifice, or thought, as involved the discovery of the law of conservation of mass, or any other scientific law. In all such cases, the subjectivist, whether he be a scientific theorist or a crude imaginer, does not disclose the mystery of things outside himself; he merely manifests new potentialities for personal artifice, revealing to him and possibly to many other people new phases of the activity of soul.

From my standpoint, all science is the evolutionary development or change of mind, as a collective organism. The science of the untutored savage is, the science of the astrologer and alchemist was, essentially, the same thing as is the science of a Newton, Dalton, or Darwin. All represent different stages of the collective mind-growth. The most exact analysis by a modern chemist no more determines real objectivity than did the searchings by the alchemist for the "Essence" and "Philosopher's Stone." The modern chemist's experience of objective truth is, not absolutely, but merely relatively to his mental environment, more reliable than the alchemist's. We now smile at the alchemist's definition of an acid—something containing the "principle of acidity." But we feel profoundly impressed when the modern chemist tells us that when hydrogen combines with elements reacting similarly to oxygen, the product is an acid. Why do we smile at the alchemist's "principle of acidity," but feel convinced by the modern chemist's definition? Because we have discovered a symmetry between our sensory per-

ceptivity and intuition which the alchemist had not discovered. Still, there is, essentially, no more revelation of reality involved in the chemist's application of intuition to a multitude of sensory observations constituting empirical induction, than in the alchemist's application of intuition to only a few sensory observations. The observations, in both cases, being equally subjective products, mere multiplicity of observations cannot alter the subjective character of the resulting truth. The main difference between the chemist's and the alchemist's definitions is that they represent different stages of realisation of the potentiality for symmetry between sensory and intellectual responses to the soul's fiat.

What constitutes science distinct from antique speculation is, not that science has got nearer to reality than did the progenitor of science, but that science, apart from the spurious metaphysics misnamed science, never accepts as truth what does not involve inferential symmetry between sensory and intellectual experience. Proceeding on this principle, science became an organism built up of co-ordinated responses of intellect and sense. In its early days, science constituted sensory experience leader and intellect follower. Later, science constituted intellect leader. Thereby science acknowledged intellect as the master of sense. Still, notwithstanding its tacit acknowledgment of the superiority of intellect, science jibs when intellect transcends certain inferences from spurious premises arbitrarily adopted by science, as final criteria of truth. Notwith-

standing that science does not openly profess to reveal absolute truth, it tacitly makes the pretension by snubbing all truth which is not its own truth. So long as science merely deals with its own special problems, it is quite justified in demanding its own sort of truth. But when science applies its own sort of truth to determining problems which (so long as science will not transcend its self-imposed limitations) are outside its arena, then, I say, science merits as much snubbing as it lavishes on truth which it cannot assay in its own scales.

Science, through the majority of its representatives, manifests a curious insensibility to the ultimate consequence of its own demonstrations. Science fails to assimilate the prime fact that knowing is nothing more than believing. Did science assimilate this fact, it would see that the alchemist who believed that an acid was a substance containing a "principle of acidity" had, relatively to himself, as good a truth as has the chemist who believes that when hydrogen combines with elements reacting similarly to oxygen, the product is an acid. When Lord Kelvin assures us that atoms exist, those of us who happen to be philosophers say : Certainly, my lord, atoms do exist, but only within your co-ordinated intellectual and sensory experience, just as does a parallelogram. On the other hand, my lord, when some eminent scientific people tell us, on such grounds as yours for affirming atoms, that the universe is self-existent ; that there is no God ; that life is nothing but chemistry ; that eminent scientists are nothing but "compound

radicles" of carbon and other elements built up, say, on Wöhler's method of preparing urea from mineral compounds—when eminent scientists get on this tack, my lord, philosophers are bound to tell them to go to school again, or to cease publishing their raw puerilities.

We call scientific laws the products of objective experience. So they are, but in a limited sense. By inference from these scientific laws we attain a still greater objectivity of purview showing us that the chemist's law of conservation of mass and all other scientific laws ultimately emanate from the limitations of human conditions of thought; that the laws are not, strictly, laws governing anything outside humanity, but are merely laws governing human subjectivity, or personal artifice. When the physicist discovered that "actions and reactions are equal and opposite," and when the chemist discovered the "conservation of mass," they discovered new laws of their own subjectivity, just as does the child who discovers that two halves make a whole. When, as an empiricist, the chemist or physicist tests an hypothesis by induction, if the induction does not support the hypothesis, the empiricist seeks another hypothesis which will include the induction. Ultimately, he attains what is called a scientific law. This scientific law involves that the scientist has brought his sensory experience into line with the law governing his intellectual experience. In other words, what the scientist has then discovered is, strictly, not an objective, but a subjective law involving a new *soul-fiat* for belief.

The scientist makes induction from sensory

observation the criterion of his "law." This is perfectly rational procedure. Nevertheless, when we deal with science from the standpoint of philosophy, we have to look at science itself objectively. Then, we find that the empirical criteria of science are, themselves, as subjective as are the intellectual processes they are supposed to test, and that, accordingly, what is established by scientific empiricism is not "law" of anything outside subjectivity, but "law" of subjectivity itself. Then, if empirical "law" is, itself, law of subjectivity, and if subjectivity, as intuition, infers from the whole body of empirical "law," subjectivity (as philosophy) has the same logical warrant for relying on its induction from the whole body of empirical "law," as subjectivity (as science) has such warrant for relying on any particular empirical induction. Thus, the chemist's law of "conservation of mass" is no more compulsive of belief than is the philosopher's "law" that mind and body are products of soul and that soul emanates from God. The philosopher's law is just as inevitably sequential to the scientist's law as the latter is sequential to his empirical induction. If chemical analysis and synthesis establish the validity of the law of "conservation of mass," so, equally, do philosophical analysis and synthesis establish the law of emanation constituting matter-spirit, and what we perceive and conceive of matter, the product of our interaction with it, as spirit.

As philosophic law is a necessary consequence of *all* scientific law, while no scientific law is a necessary

consequence of all other scientific law, philosophical law is more compulsive than is any scientific law. I may even assert that all scientific law is ultimately self-stultifying unless it be considered as part of the induction of philosophical law. Of course, I make this assertion regarding philosophical law, with the proviso that the philosophical is logically inferred from the scientific law. I entirely scout the *a priori* transcendentalism which once constituted the only philosophy, and which, even yet, occasionally poses as philosophy. My axiom regarding philosophy is that it must have a clear pedigree binding it to sensory empiricism, however far it may transcend that empiricism. Just as we cannot have a thinking brain separated from a pulsating heart, so we cannot have real philosophy divorced from sensory empiricism. If anybody can demonstrate that any doctrine advanced in this work is not "genealogically" bound to sensory empiricism, I will discard that doctrine.

What I combat is, not the application of subjective results to issues within the arena of subjectivity, but the application of such results to issues which are outside the subjective arena. When, for instance, a man tells me, on the strength of such wrong application, that there is no God, that the universe created itself, I am inclined to express dissent in terms more forcible than polite.

Consider this latest scientific hypothesis of vortex atoms—what is it, essentially, but reducing the sensible phenomenon of a swirl in air or water (such as we perceive in the case of removing the plug of

a filled water-basin, or in the case of water in rapid motion through an india-rubber tube) to infinitesimality and saying this explains "atoms" as swirls differentiated from the ordinary ether as the water or air swirls are differentiated from the surrounding water or air states? True explanation must be *synthetical*, not a mere restatement of fact. In the case of these assumed ethereal vortices, all that is really done is to restate a fact and imagine sensible as insensible effects. Our ether and atoms then become merely mentally refined air or water, or the atoms are impossible. Inasmuch as the physicist's ether is a "perfect fluid" (incompressible, frictionless, etc.), he is now trying to invent some plausible mathematical statements enabling him to overcome the difficulty of dealing with ether-swirls as analogous to air-swirls. When this is done, he will have "explained" the formation of "atoms." But his "atoms" will then need "explaining" as much as did the manifestations in the water and air. All he will have really accomplished will be to substitute ether-swirls for air or water swirls as a crux. *Cui bono*, as real explanation?

Professor Lodge writes, in *Modern Views of Electricity* (Macmillan): "Now, then, we will ask first, What is Electricity? and the simple answer must be, We don't know" (p. 370). That is all I stipulate for as avowal by the scientist. However, on the warrant of Professor Lodge's "don't know," certain eminent people say they *do* know that "atomic mechanics" accounts for physiological life and mental

action, and excludes the necessity of invoking a Creator for the universe. Besides these eminent folk, a number of folk who are not eminent are imputing so much "know" to science that they are forgetting the existence of such a thing as morality. So long as scientific people take care to render prominent their "don't know" avowal, I say to them : Go ahead as fast as you can, applying "personal artifice" to your interactions with things not yourselves. That way lie discovery and invention, good things in their way, but apt to be overestimated.

Professor Lodge tells us that heat is a "form of energy." To me, it is the product of interaction between units of stimulus and consciousness constituting something not myself, with such units constituting "myself." Who is the true objectivist—Professor Lodge or I? He can apply mathematics to his "energy"; I cannot apply it to my "units." How can he apply mathematics to his "energy"? Only by transforming "energy" into an imaginary analogue of a sensed body and applying to it the fictions time, space, and motion, can he effect his purpose. As time, space, and motion are dependent for conceptual existence on "personal artifice" applied to what we sensorise as gross matter, why is Professor Lodge nearer objective truth in positing light and electricity, as "energy" distinct from "matter," than I am in positing them as the resultant of interactions between "units" constituting matter itself and myself, as "matter" and "soul"? Why shall it be said that I am

subjectivist in positing "units" which I cannot define in terms of time, space, and motion, but that the professor is objectivist in positing "energy" which he can define in such terms?

If I can show that time, space, and motion are themselves subjective ghosts, why cannot I claim superior objectivity in repudiating "energy" and confining my affirmation to "units" outside spatial, motive, and temporal contingency? Again, when Professor Lodge writes: "Here is a battery—that is, an electricity pump; it will drive electricity along"—why shall I not assert it drives nothing along, except interactions between the professor's "units" and its own "units," just as I assert that a rap on my knuckles with a ruler "drives along" analogous interactions between me and the ruler? Why shall I not isolate the pain, as Professor Lodge isolates electricity, or light? Shall I not do this because I cannot apply space, time, and motion to pain and pleasure, as the professor can apply them to electricity and light? Well, this merely involves that I shall arbitrarily apply what are equally subjective as are pain and pleasure (space, time, motion) to determining the reality of two things (electricity and light) equally subjective as are the others.

If I can intellectually project time, space, motion out of reality, why shall I not deny the reality of what depend for their verification on the assumption of time, space, and motion? Why shall I not assert that my "units," independent of time, space, motion, are more real than are the professor's

electricity and light, dependent on time, space, and motion? Suppose it be urged that my intellectualism projecting time, space, motion out of reality is as subjective as is the professor's intellectualism incorporating electricity and light, as reality—what then? I have, on the assumption, subjectively projected something out of reality; the professor has subjectively brought something into reality. But mark! what the professor has brought into reality depends on what I have projected out of reality. What must here decide between me and the professor is not *how* we do, but *what* we do. Inasmuch as what I project out of reality does not depend on what the professor brings into reality, but what he brings into reality does depend on what I project out of reality, I can afford to give the professor the product of his subjectivity, but he cannot afford to grant me my product. For if he grants me my product, he implicitly denies his own product. Accordingly, I say that my subjective product is better as reality than is the professor's, and that I am the better objectivist.

But, it may still be urged, why talk about comparative objectivity when both you and the physicist are subjectivists by nature? I reply: To the extent that intellect can elaborate, from sense-experience, to experience beyond sense, intellect attains a more impersonal standpoint, and, to the extent it does this, intellect attains objectivity. The measure of objectivity attainable by humanity is the measure of impersonality derived from sense-experience. So

long as our intellectual "links" are firmly attached to our sensory "links," the further we proceed in the intellectual direction, the nearer we approach true objectivity. We attain the greatest remoteness from the sensory (personal) "links" as undefinable generalisations—that is, as logical inevitables to which we can apply no sensory tests. Now, assuming the physicist's atoms, ethers, energies to be really links of the chain from sensory experience (which I have shown they are not), so soon as we apply time, space, and motion to these atoms, etc., we degrade them from their objective status as projections out of sensory experience into mere infinitesimal copies of what we sensorially perceive as solids, fluids, and gases. Thereby, we nullify our objective achievement of intellectual fabrication of the atoms, etc., by implicitly reverting to our sensory fabrication of solids, etc., and to the extent we do this, we degrade ourselves towards subjectivity. Then, we only bound towards objectivity in order to rebound towards subjectivity.

But, it may be urged, the professor's demonstrations regarding light and electricity are more important to humanity than are my demonstrations regarding time, space, and motion. Such a contention is true, or untrue, according to the standpoint we adopt. He who considers human progress as a mere question of advance in applications of natural phenomena to our sensual ends, will plump for the professor. He who considers these applications of comparatively trivial moment in respect to human

progress, will have to stake on me. I think I have shown, in this work, that there is no rational standard of human progress but the ethical standard, and that the materialistic issues arising from ultimate speculations based on application of time, space, and motion to determining reality are now tending to destroy the apprehension of morality and to turn civilised humanity to ideals presenting the gratification of sensual appetite as the *summum bonum*. Accordingly, I venture to assert that my projection of time, space, and motion out of reality is vastly more important to humanity than is the physicist's application of time, space, and motion to bringing light and electricity into reality.

Professor Lodge illustrates how a battery pumps electricity, by the analogy of a model consisting of an arrangement of tubes connected with a pump and tank of water, and with a glass receiver and india-rubber bag, the latter inside the receiver. The space inside the bag is supposed to represent the inner, and that inside the receiver, the outside coating of a Leyden jar which is typical of all electrical charge. By a suitable arrangement of stop-cocks, and two pressure-gauges inserted in the tubes, after filling the receiver, the bag, and the tubes with water and working the pump, the bag is gradually distended with water and, of course, so much less water is in the outer glass receiver. This represents the pumping of electricity into a Leyden jar, as well as the pumping of water into the inner bag, rendered possible through the removal of pressure in the outer

receiver by opening the stop-cock leading to the tank which represents the earth. The pump represents the electrical machine.

What we observe in charging a Leyden jar is perfectly represented by the effects in the hydraulic arrangement, always assuming, however, that a *thing* distinct from mere interaction between the electrical machine and Leyden jar is transferred from the former to the latter, as a thing likewise distinct from the pump and the elastic bag, is transferred from the tank by the pump to the bag. In the case of the hydraulic apparatus, we are dealing with a *thing*—water. Are we dealing with such a thing in the case of the jar and battery? I contend we are not. I contend that we do not put into the coating of the jar a real thing such as we put into the elastic bag. I maintain that what is put into the jar is an interaction—what I may term an atomic emotion. When we talk of pumping, we imply the removal of air and creation of a “vacuum.” What do we do analogously in “pumping” electricity? What do we remove in the way of “pressure” to permit the sucking-in of electricity?

Of course, if we like to deal with a mere interaction as a thing in itself and apply mathematics to it, that is our concern, and I am not contending that it may not be practically advantageous to adopt the procedure; but what I want to get at is: Does the procedure establish equal existence for electricity, as a thing in itself, as we can demonstrate in the case of water? That water is practically incompressible we

verify by sense-experience. That electricity is theoretically incompressible—as affirmed by Professor Lodge—we verify by assuming that what we sensorially apprehend in the case of water occurs in what we do not sensorially apprehend—electricity. Again, to maintain this major assumption regarding electricity, we have to make a multitude of minor assumptions enabling us mentally to assimilate, as analogy to what we sensorially perceive in the case of the expanding bag, what we do not sensorially perceive in the case of the Leyden jar. For instance, we have to assume that the pith balls register pressures as do the pressure-gauges in the hydraulic arrangement. We have to assume that electricity on one of the coatings of the jar cannot be accumulated for the same reason that water cannot be accumulated in the bag, so long as the outer receiver is not emptied of an equivalent quantity. I am not going to assert that Professor Lodge is not justified, from his own standpoint, in adopting his analogy, but, assuredly, it has no significance to me except as analogy between inference based on sense and inference based on concept. I do not deny that electricity is incompressible, any more than I assert that it is compressible, or any more than I affirm or deny that pain is compressible. I merely say that until electricity is shown to be something to which I can conceive the term compressible or incompressible as being applicable, it seems premature to discriminate on the point. So far as I am concerned, I am unable consistently with my apprehension of words

and things, to apply either of these terms to what I cannot sensorially perceive. I can no more so perceive electricity than I can perceive motion apart from something that moves, or than I can perceive pain apart from something that reacts to stimulus.

Of course, I can imagine pain in the abstract and call it severe or trifling, as I can imagine motion and call it rapid or slow, or as I can imagine electricity and call it compressible or incompressible ; but in all these cases, I feel assured that I should be dealing with very different contingencies as compared with my tasting sugar and calling it sweet, drawing a razor across my hand and calling it sharp, or trying to pump water into a filled closed vessel and calling water incompressible. The razor, water, sugar are very different entities from the abstract pain and motion and the unsensed electricity.

Professor Lodge writes : " The existence of an ether can legitimately be denied in the same terms as the existence of matter can be denied, but only so. . . . The evidence for ether is as strong and direct as the evidence for air. The eye may indeed be called an ethereal sense-organ, in the same sense as the ear can be called an aerial one, and somewhat in the same sense as the hand and muscles may be called a sense-organ for the appreciation of ordinary matter." Against this, I venture to urge, as indicated in Chap. VII., that the ear does not enable us to perceive air, but merely affords us the experience of something (sound) that physicists say is caused by air. Accordingly, I demur to the pro-

fessor's assertion that the ear is an aerial sense-organ, just as I should demur to the assertion that my knuckles after receiving a rap with a stick were stick-sense-organs. The aerial motions are no more sound than the stick, from the standpoint now under consideration, is pain.

Similarly, I deny that the eye is an ethereal sense-organ. The eye merely enables us to interact with a body in a particular state we call luminous. Physicists call this interaction light and say it is caused by ether. Finally, the hand and muscles do not enable the brain to apprehend "ordinary matter," but merely enable it to apprehend what we call resistance. This the brain transforms into "ordinary matter."

To assert, as does the professor, that we can only deny the existence of ether in the same terms as we can deny the existence of matter, is equivalent from my standpoint to asserting that we can only deny the existence of a ghost in the same terms as we can deny the existence of a white sheet. The terms in which we could deny the existence of matter would be on the ground that sensory intuition of properties was not real experience. If such be the case, then all concepts—ether among them—are unreal, because they all originate through sensory intuition of properties constituting matter. If we deny matter, we deny, by implication, ether; but matter exists whatever we do regarding ether. Ether only exists because physicists imagine that an hypostasised symbol of an interaction which they call light requires a medium for its transmission, or that this "light" (as ether

itself in movement) is an attenuation, without sensible body or parts, corresponding to something which only exists as sensation of properties and which we call a gas. The gas exists on the ground that we can sense it. The ether only exists on the ground that mathematicians think they can conceive it, and only think they can conceive it, because they think they can conceive space, motion, and number as they can feel spatial intersection, movement, and differentiated acts of sensory apprehension.

Again, as there is no evidence at all for properties, as matter, excluding the evidence of sense, and as air is matter, to assert, as does the professor, that the evidence for ether is as strong and direct as is the evidence for air, is to assert, by implication, that there is sensory evidence for ether. My view of evidence compels me to assert that not only is the evidence for ether weaker than that for air, but that there is no more real evidence for ether than for a tangible abstract circle or number. If we like to conceive symbols derived from percepts (number, line, point, ether) as constituting properties equivalent to what we perceive as their origins, there is nothing but the limitations of our imaginative faculty to prevent our pursuing this method *ad infinitum*. But to say the results of this exercise of imagination involve reality equivalent to the immediate intuitions of sense is merely to make *ex parte* assertion, of which the logical issue is that anything we can imagine is real, not merely as imagination, but as demonstration of *ens*.

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We infer from sensations through touch, sight, hearing, smelling, tasting that an objective world exists. Beyond these sense-experiences we have no foundation for such inference. We have no such foundation for affirming the existence of ether. We can so infer to the "units" I suggest, because we can experimentally show that "ordinary matter" is reducible to immateriality. But we cannot thus show that matter is reducible to the ether of physicists. This ether is merely an assumption invented to account, not for sensory experiences themselves, but for certain idealised after-effects (light, etc.) of those experiences. This ether is invented to account for light and electricity, and the ether that answers for light won't answer for electricity. Had we not found that we could fancifully account for sound, another such after-effect, as aerial motion, we should not have troubled ourselves about ethers to account for light and electricity. Physicists, like the rest of us, are fond of analogy, so they discovered analogy between sound and light. However, they reverse their procedure in the case of light. While they do not constitute sound the warrant for the existence of air, they constitute light the warrant for the existence of ether. They have no reason for positing ethers but the existence of light, electricity, etc.; but they have multitudes of reasons for positing air, independently of sound.

If we treat light as independently perceived, we may so treat darkness; if we so treat heat, we may so treat cold; if we so treat electricity, we may so

treat shock of any sort ; if we so treat sound, we may so treat silence. Each of these is as much as, but no more than, the other a matter of independent sensory experience. Really, they are all idealised after-effects of sensory experience quite distinct from that experience. We have no genuine sensory experience of anything but matter. This experience we get through sight, touch, taste, smell, hearing.

Obviously, the physicist's method of arriving at ether is the reverse of sensory verification. We do not authenticate a rose by arguing about colour and scent ; we simply look and smell. The evidence for the flower is complete before we even think "rose." That is genuine sense-experience. When we start arguing about colour and scent, we are on totally different ground from that affording us the notion of the rose. In the former case, we are merely dealing with conceptual superstructures arising from our basical sensory stimulus. Did we deduce an ether from colour or scent, we should emulate the procedure of the physicist in regard to his ether. If we say the colour partly affording us the notion of the rose arises through interaction between units of stimulus and consciousness constituting ourselves and the rose, we infer directly from sense-experience. If we say that the colour arises through the absorption of certain "rays" and the reflection of others, we are arguing from conceptual fantasies essentially divorced from sense-experience. If we say that light is the product of interactions analogous to those involving scent, colour, contour, bulk, density in the case of

the rose, we are arguing from sensory ground. If we say that light is "rays" reaching us through "ether," we are arguing from conceptual ground, just as we are when we say that if $x=y$, $y=x$. Our light and its ethereal corollaries are just as fully symbols of imaginative thought as are x and y . As x may stand for a function of light, so does light itself stand for a function of interaction. In neither case is the symbol the thing, or inference from the thing.

It may be urged that we feel electricity when we get a shock. I grant we do if we like to call the effect electricity, just as we feel pain when we burn our finger; but we do not, on that account, isolate pain as a thing in itself and define it in terms of time, space, and motion; we merely consider it as an effect of something we can apprehend by a special sense, or by a number of special senses. What we can only feel, apart from special sensation, we do not normally identify except as an imaginatively abstracted effect. Science, in its transcendental aspects, contravenes this normal procedure by attributing causal efficiency to, and defining in terms of sense, what cannot be identified by sense. So far as it does this, science fails to infer from sensory experience, and adopts *a priori* assumption as the basis of intellectual structures which, however logical they may be in themselves, are vitiated by the fact that their premises implicitly attribute causative efficiency to what can only be identified as imaginatively isolated effect. While this procedure no doubt affords us the sensation of

much practical truth, it involves social mischief when employed, as many employ it, to discredit the only foundation on which can be built an effective moral system. When, through this procedure, we reach "atomic mechanics" as the ultimate solution of the universe, those who see, in morality, the prime essential of social stability, are justified in entering a protest.

I think that scientists of real calibre, in this country at any rate, are under no illusion as to the ultimate limitations and shortcomings of their method. On the other hand, as science, by some of its leading representatives, and through its pretensions to *explain*, without invoking the "supernatural," encourages multitudes of people bereft of beliefs to fly to it as sanctioning their inclination to ignore moral law, I think it is the duty of those who recognise the flimsy credentials, as an explaining agent, of much that passes as science, to render prominent the fact to the general public. Knowledge is a fine thing, and the transcendental physicist is supplying a good deal of a sort. We want to know the other side too.

Professor Lodge writes: "Consider, first, conduction. Connect the poles of a voltaic battery to the two ends of a copper wire, and think of what we call the 'current.' It is a true flow of electricity among the molecules of the wire. If electricity were a fluid, then it would be a transport of that fluid; if electricity is nothing material, then a current is no material transfer; but it is certainly a transfer of electricity, whatever electricity may be" (*op. cit.*

p. 73). I quite admit that electricity is a known entity in the sense above indicated by the professor. Anything is known in this sense, to which we can apply a definitive symbol. What I impress is the essentially different character of definition based on the evidence establishing electricity, as compared with definition based on the evidence establishing, say, the existence of a granite boulder.

The professor talks about a flow among the molecules of the wire. So far as inference from sensory experience is concerned, he might as well talk about a flow among the molecules of an emotion. There is no more real evidence for molecules in a wire than in an emotion. If molecules exist, they do not exist within spatial determination, because that depends on the condition of sensorially perceived relationship. As already shown, there is no spatial relationship where there is no sensed relationship. Then, as molecules do not exist within spatial relationship, to talk of a flow among them is meaningless. A flow involves movement, and this involves spatial relationship, which again involves sensed relationship. If something moves between other things, the things must be sensed. From the philosophical standpoint, we may as well talk about the flow of a note of interrogation as about the flow of electricity. To apply such terms as current and flow to electricity is, from my standpoint, to use symbols to mislead real apprehension, however convenient the terms may be as arbitrary, specialistic expression. Immediately we apply sen-

sory definitions to concepts we are on the road to ruin of clear apprehension. However admirable figurative terminology may be in poetry, in science and philosophy it obscures what it pretends to illuminate.

When we call a Polar bear a white, hairy, plantigrade mammal, we get terms affording us real knowledge about the bear—always providing the bear has been seen, or otherwise shown, by sensory demonstration, to exist. When we talk of electricity as being a current, or flow, or even of its being transferred, we emulate the mythologist who describes Gorgons, dragons, centaurs *et hoc*. The descriptions are beautifully exact; still, we want to see those Gorgons. So of the electricity of Professor Lodge—he can tell us a great deal *about* it, but he cannot show us *it*. He can show us the voltaic battery and the wires and a multitude of curious effects, but he can no more afford us real cognition of the electricity than he can make us see an invisible point.

Of course we may build a logical structure by imagining electricity as a material fluid, whether it be or be not such a fluid. The point is that the implication of transcendental physics is not merely that it establishes a logical sequence based on conceptual premises, but that it establishes such a sequence built on sensory premises. The outcome of this pretension is “atomic mechanics” as solution of the universe. If “atomic mechanics” *is* that solution, I say: Let it prevail! But if “atomic mechanics” is a fatuous parody of solution, I say:

Let those who impose it on a sensualised, ignorant, faith-bereft public be nailed to their falsity.

As already indicated, what we do when we discover a new truth regarding phenomena or invent a new appliance is, essentially, to hypnotise matter—that is, to impose on it soul-fiats involving that the “soul” of matter, apprehended by us as “form” (primarily, as indicated in Chap. I., affording us rudimentary knowledge as “unsymbolisable sensation” of externality), shall afford us manifestations which, by way of rough analogy, may be compared with the responses of a human subject to the hypnotist. We will (not in the conventional or psychological sense, but according to my demonstration, to be later given, of the true nature of willing) that matter, as “form,” shall afford us the sensation of a new scientific “law,” or that it shall appear to us as a new contrivance, essentially as the hypnotist wills—not necessarily consciously—that a subject shall perform specific actions. As ultimate causation, God wills that we shall respond to His will by hypnotising matter into affording us the experiences of what we call scientific laws and appliances. Thus, God hypnotises or wills us into changing our truths or beliefs by hypnotising matter into affording us fresh mental pictures. So soon as God enables us to hypnotise matter into affording us a new truth, we first impose, as it were, a new truth on matter, and matter acts that truth by affording us new sensations conforming with it. We normally emulate matter by acting these sensations. That we also

abnormally diverge from this natural conformity, by acting contrarily to much we believe, involves as dishonesty, as already emphasised, practically all the evils besetting modern civilisation.

Matter, ultimately, is mind or spirit. The universe is a mind-organism emanating from God. The "form" of matter, as objects, is its response, as hypnotised "subject" to ourselves as "hypnotists." Matter affords us no *definable* reality other than this "form." The "material" of objects is their "soul," or potentiality to respond to us by revealed "form." This "material" or "soul" of objects we can only apprehend as inferential generalisation in such terms as my "units." What, in this and other works, I have termed the mind-environment, is God's hypnotism of our souls, involving their response to our "forms," or bodies (as "form" of the matter-soul), as specific mental changes constituting new truths. What we recognise as conviction and doubt is this supreme hypnotism differently manifested. So of all the intellectual, sensory, emotional manifestations of our being—all are God's hypnotism of our souls, manifested to us through our "forms," or bodies, which, again, are constituted of the soul of matter, appearing to us as its "form" and conditioned by our soul. Thus we may say that God conditions the soul of matter through our soul.

As earlier indicated, belief is knowledge or truth, and may be fit or unfit. Professor Lodge believes his electricity exists. So it does exist, *for him*, just as a flat earth exists for him who believes it to exist.

Everything that exists for us only exists through our believing it to exist. I call a certain body, say, steel. It is steel because somebody we call its original discoverer "hypnotised" the soul of matter, and thereby attained a new sensation of belief. It so happened that this new sensation, by God's decree, or what we may call the evolution of experience, was destined to be not what I may term sporadic and evanescent, but what I may term infectious—that is, it was destined to become common to a great number of people under similar environmental conditions. "Steel," as a sensation of belief, would then become general, and all matter, under specific conditions of interaction, would be "steel." To apply a rough analogy, steel would then be "caught" as is small-pox. It would be "caught" as belief.

If, after I had "caught" steel, I believed, through say a casual, careless glance, an iron article to be steel, it would be steel for me as fully as would real steel, because I should have the sensation of belief which alone caused steel to exist, though I should then be "infected" with the steel belief by what, under different conditions involving what I call experimental tests, would "infect" me with iron belief. When I applied these experimental tests, I should lose the iron belief and get steel.

This applies to Professor Lodge's electricity belief. If he tests by my criteria, he will lose his "electricity" belief and get my "units of stimulus and consciousness" belief. Just as I believe the experimental tests, in the case of the steel, to be more

reliable than the casual glance, so I believe my philosophical tests, in the case of the electricity, to be more reliable than the professor's mathematical and experimental tests. Professor Lodge hypnotises matter to afford him the "electricity" belief. I hypnotise matter to afford me the "units of stimulus and consciousness" belief. I prefer my belief because I can show its continuity from the basis of all belief, sensory intuition, and because I believe the professor cannot show such continuity in the case of his own belief. Accordingly, I call my belief philosophically fit and the professor's belief philosophically unfit.

Everything we discover, invent, or construct depends for its creation on the sensation of belief, arising from our hypnotism of the matter soul. If we fashion a chair, or invent a telephone, what we do is so to hypnotise matter as to derive specific sensations of belief. I recognise a chair because I have been "infected" with certain sensations of belief which normally always arise under the particular conditions of excitation by the matter soul. That the essential thing itself is in "me," not in the object, is readily demonstrable by the facts of hypnotic suggestion, to which I shall later devote full consideration. I here need only remark that in the state of hypnosis a person believes as strongly, say that a chair is a jug, or *vice versa*, as he believes, when aroused from the abnormal state, the objects to be as they normally appear.

I have earlier referred to "unsymbolisable sensation" as being the substratum of perceived relation-

ship. In the case now under consideration, this unsymbolisable sensation involves my apprehension of the chair as "not-me," something external to myself, so constituting my first knowledge of an incipient chair. Here I have belief not yet realised as conscious differentiation. Later, this unsymbolisable sensation enters the realm of conscious differentiation as various sensations of bodily extension involving contour, density, etc. Then, I get the totalised "chair" sensation, or belief, as certain properties or attributes representing for me the matter soul under particular conditions of excitation. The thing underlying all this conscious apprehension of the chair, as belief, are the "units of stimulus and consciousness" constituting the soul of matter which I have "hypnotised" into affording me specific sensations or beliefs. These constitute for me the chair, and must be what I will term the nuclear premise for everything I can know about the chair.

What I call seeing and touching the chair is willing the matter soul to afford me specific sensations or beliefs. When I have willed these beliefs as basis, or nuclear premise, what I call intellect enables me to elaborate the primaries into what I call inferential consequences, or another order of beliefs, which are thus evolutionary developments of the nuclear primaries. Thus, I may infer that the workman who made the chair (that is, who started his process of willing the matter soul as what is called rough material, under conditions different from mine as merely observing the chair) was an

efficient or inefficient craftsman, according to my belief constituting what I call the stability of the chair. If the chair afforded me an "instability" belief, I might infer a poor workman. If it afforded me a "stability" belief, I might infer a good workman.

Of course, I might infer wrongly. The workman might be as good if I got the "instability" belief as if I got the "stability" belief. His master might desire to turn out cheap and poor work, and so would impede the exercise of the workman's efficiency. Nevertheless, however inconclusive my inference might be, it would be right as method, because it would be a normal or logical process continuous with sensory experience involving, as "nuclear" premise, the chair belief. What I should lack, involving the wrong conclusion, in this instance, would be sufficient induction of premises correlative to the chair itself. To reach a sound conclusion I should here need to infer from many other "nuclear" premises, or beliefs, besides the chair belief. As I wanted to know about the workman as well as the chair, I needed "nuclear" premises involving him as well as the chair. If I had only wanted to know about the chair, the chair belief would constitute my sole "nuclear" premise. Philosophical truth depends on the application of the widest induction to the most rigidly determined "nuclear" premise. Hence, if we want philosophically to verify regarding any specific experience, we primarily keep our premise clear from all others. For instance, if we want philosophically to determine the nature of matter,

we must have a continuous line of inferences from sensory intuition constituting as nuclear premise our basical belief about matter.

However many and foreign inductions I may apply to verifying about matter, I only get real knowledge about it so far as I can demonstrate a clear inferential line of connection between my conclusion and sensory intuition, as nuclear premise. If I want to know about the chair and start an inferential process from, say, a horse, I shall obviously fail. If I want to know about a gas and start inferring from "space of x dimensions," I may as well whistle. We may inferentially bind the horse, chair, and gas to sensory intuition, therefore they are credal "species" within the realm of philosophical investigation, to be dealt with as real entities. "Space of x dimensions" cannot inferentially be bound to sensory intuition, and is accordingly no credal "species," the reality of which philosophy will grant. So of ether, light, electricity *et hoc*—all are outside philosophical "species."

Of course we may take these conceptual or imaginary species as nuclear premises on which to base inferential processes. Then, we get to know about these conceptual species. But we have no inferential bridge connecting them with the philosophical species. They are merely intellectual replicas of what, to philosophy, only really exist as sensory intuitions. Philosophy has abandoned the savage's method of accepting imaginary nuclear premises as equivalent to those of sense. To philo-

sophy, the attempt to interpret the nuclear premises of sense by inference from those of imagination is no more rational than would be the attempt to deduce the colour of a blackbird from the taste of an apple.

In discussing right morality, in earlier chapters, I showed it to consist in action according to belief, and I illustrated the fact by the impossibility of right in the spheres of industry, invention, science, and philosophy unless as such action. I may now carry the illustration deeper. When we will matter to afford us specific beliefs as its sensorised properties, we normally always act these beliefs. For instance, we always act in sensorising, say, the chair, according to the belief. We never act as though the belief constituting the chair involved, say, a coal-box. Thus we see that this right morality is rooted in our very being, and that its infringement must involve morbid abnormality. The rule holds good whether we consider concrete or abstract relationships. From the very bed-rock of our knowing to its most transcendental phases, there is no normal rule but action according to belief.

I now again refer to the Röntgen "rays." Here we have willed matter to afford us a new response contradicting all our earlier notions regarding opacity and transparency in bodies. We have, as it were, hypnotised bodies, through hypnotising rarefied matter into affording the "rays." We call this hypnotism, discovery of new properties in matter. But, the properties, as we sensorially apprehend them, are not of matter, but primarily of our own

souls hypnotised by God. The real properties of matter involved are outside our immediate cognition, as potentialities of the soul, or "material" of matter, for response to our soul, or "material." We are, essentially, as passive agents in the "discovery" as is the matter. Our soul wills as unconsciously to ourselves, as the matter's soul wills to itself. (I shall elucidate this unconsciousness of willing in a chapter devoted to the consideration of soul.)

Without "discovering" any new property of matter such as involves the Röntgen rays, some human souls, as percipient subjects in the hypnotic state, can see through conventionally opaque bodies. Here, human soul-fiat, under the condition of what we commonly recognise as hypnosis, directly hypnotises the normally opaque bodies, as scientists hypnotise those bodies through the intermediation of the "X-rays." The abnormally percipient human subject wills away opacity no more unconsciously than does the scientist who feels the sensation of effort in his accomplishment in dealing with the various intermediary agents. The normally opaque matter, rendered transparent by the scientist's "rays," is no more penetrated by an entity than when it is rendered transparent by the hypnotised subject independently of the "rays." The two processes of creation of transparency merely involve two processes of hypnotism issuing in special interactions with and without the "rays."

Every new fact we perceive comes to us through this process of passive response to hypnotism by God.

Whether it be a sensation, emotion, or intellectual discovery, it occurs primarily as our unconscious response to the mind-environment, or hypnotism by God. Then, it is perpetuated by tradition, as education, or else by hereditary continuity, which latter, as already indicated and to be later further elucidated, is equivalent to perpetuated soul-fiat, as what biologists call continuity of the germ-plasm.

If we can now only believe through intellect, the discovery of the fact is as fully response to God's hypnotism as is the discovery of the "X-rays." The latter, no more than the former, is, at root, a product of any initiative spontaneity in ourselves, and we can no more resist the evidence for the one than for the other discovery. That some of us try to resist the evidence for the discovery of the fact that we can now only believe through intellect, is merely a transient condition of evolutionary change from one to another form of normal response.

Our beliefs are not what we want them to be. If a pauper wants to believe he is a Cræsus, that does not affect his belief. Similarly if a bishop wants to believe that Christ is coequal with God, his wanting does not affect his belief. It may turn him into an intellectual rogue, but his belief will be there in defiance of himself.

What we perceive as the interactions of matter with matter—say as chemical or mechanical phenomena—are not primarily occurrences in the *ens* or soul of matter, but within ourselves. What takes place in the soul of matter we cannot perceive because we

cannot perceive the soul of matter. We can only infer to it as the "units of stimulus and consciousness" propounded in this work. In chemical and mechanical phenomena, the interactions which we perceive between bodies or properties are within ourselves, just as are the properties between which we perceive the interactions. Our discoveries of new properties in matter are discoveries of new properties in ourselves. The new properties in matter are never there until they are in ourselves, as hypnotists of the matter soul; nor, again, are the properties in ourselves until we have been "hypnotised" by God. Thus, the new properties are created by us in matter, and created in us by God.

The conclusion above indicated will enable me to offer a profounder reason than I have earlier submitted for the proposition that supreme human belief or knowledge must be continuous with sensory experience, not divorced from it as in the case of knowledge (such as mathematics) involving imaginary conceptual premises. If all we know as experience of phenomenal metamorphosis is really change involved in our own psychical development interacting with the soul of matter, as externality, it will be obvious that genuine inference from sensory experience involves the supreme logical method possible to humanity, inasmuch as it involves a continuous system of inference coterminous with our apprehension of the universe, which, for us, is coterminous with the universe itself. In comparison with this transcendently or philosophically abstract ratiocina-

tion, mathematics and all cognate abstraction, as introspective philosophy, is illogical, inasmuch as its basical abstractions are not universal, but fragmentary and arbitrary. Deeper in our cognition, because deeper in our universal experience, than the symbols of such fragmentary processes are the symbols defining our evolving experiences, as real empiricism, of phenomena, which latter symbols are essentially as fully products of our mind as are the fragments which we arbitrarily isolate as introspective definitions in the case of mathematics and cognate systems of knowledge.

When we argue from these bed-rock data of sense, we really are one with the universe itself, while, in the case of mathematics and other cognate conceptual systems, we merely feel what I may term a restricted cycle of excerpts from this universal experience, involving that we are ever within a circle, not really of our mind in the universal sense, but of various abstracts from our mental universality. In the case of mathematics, applying the mental abstract, or particular, to the mental universal (our changing experiences of phenomena), we bring the universal (as in mathematical physics) into relation with the particular, but only by imagining, as arbitrary fictions (atoms, molecules, ethers, energies), abstracts from the universal or the ever-varying totality of our response to externality involving the inferential philosophy I propound. In the case of this abstract from universal experience, we are necessarily always within a circle limited by the arbitrary fictions on which

we build our inferential structures. In the case of the genuinely universal experience, as my inferential philosophy, we are no longer in a circle, but are continuously moving to fresh, and I think I may say, higher apprehensions of our own universality as systems responding to the God-soul.

Behind all our discoveries and achievements is the above-indicated hypnotic determinism by God. In hypnotising matter to afford us specific experiences as body or "form," we cause corresponding changes in the soul or "material" of matter underlying its "form" or body. The changes we so produce in the "material" or soul of matter constitute the specific "material" or soul of the particular body which then exists for us. In discussing Monism, I affirmed the validity of the distinction between subject and object, and that specific phenomenal "form" involved specific "material" underlying that "form." I contended that "form," apart from "material," involved the denial of existence. "Material" of objectivity constitutes its permanent *ens*. "Form" constitutes its transitory extrinsic, or what we sensorially apprehend as its bodily existence. By this "form" of objectivity we perceive our own individuality as physical entity. Our body is as much objective to our essential "self," or soul, as is any other body, and our reactions to matter, as what we call sensorised objects and as "scientifically" defined analogies (atoms, etc.) of what we perceive by sense, no more enable us to recognise the true *ens* of matter, than, say, the chemical reaction of

one class of matter to another affords the interacting substances knowledge of the true *ens*. This true *ens*, or soul, of matter is always outside possible definition in the terms of sense-experience. Like our own *ens*, or soul, it can only exist as substratum or "material," involving differentiated interacting individualities (perceived by us as body, or "form") through the will of some entity outside the conditions of interaction, and hence, absolute unity.

This non-conditioned entity is God, in whom, alone, subject is also object and object subject—in other words, in whom subject and object cease to exist, and Absolute Oneness alone is. In relation to this Absolute One (but only in such relation), the *ens* of cosmical existences (our souls and the soul of matter) constitute "form," because such cosmical *ens* exists only through the Unconditioned One, as the cosmical "form" exists only through its *ens*. Conceived apart from this One, the cosmical "material" becomes equivalent to the spurious monistic concept of specific "form" in relationship, independent of specific "material." By positing, as does the Monist, related (differentiated) "form" as not involving related (differentiated) "material," relative (the only possible) cosmical "existence" is conceptually annihilated.

If the universe exists, as monistically propounded, as absolute oneness (*i.e.* as subject and object unified), then differentiated existence is a phantom, and what we perceive as ourselves and an objective world are "forms" independent of corresponding "material." Then, God becomes merely the inter-

acting "forms" or phantasmal universe so postulated. As what interacts is necessarily conditioned, God, according to the monistic hypothesis, is conditioned "forms," or else the universe does not exist as differentiated constituents. But if something (call it what you like—thought, mind, ourselves) conceives existence, this "something" must exist, and in the very act of conception perceive relationship. Accordingly, if conception exists, the cosmos as interacting entities exists, whether we (as conception) alone represent that cosmos, or whether "phenomena" exist outside ourselves (or conception). If we alone constitute the universe as conceiving it, either we exist as differentiated entities, or conception is stultified, and we may as well cease the exercise of reason. If we, as conception, do not exist individually, conception does not exist. If conception exists, it exists as relationship, and is accordingly individual entity conditioned by other entities. Then subject and object exist as "material," because they exist as conception. This involves that relational "form" independent of "material" is the stultification of conception.

According to the Monist, ourselves and all we apprehend as not ourselves is implicitly "nothing"; for interacting "form" without interacting "material" is, on the conditions, "nothing"—the negation of existence. Monism stultifies, *en bloc*, all our experiences by projecting them—through imagination, not logical inference—into other experiences annihilating them. The very fact that we are thus able to

imagine existence as out of existence proves the fact of existence—that related “forms” must involve related “material,” and that subject consequently exists as “material” differentiated from object as “material.” There is no true validity in science when it pretends, by implication, to deal with the “material” of phenomena in terms of what (sense-experience) only enables us to apprehend the “form” of phenomena. Science, by implication, makes this philosophically spurious pretension in the various transcendental hypotheses to which I draw the reader’s attention in this work.

What is called scientific scepticism, so far as the term involves doubt, is a misnomer. Scepticism, in the sense of doubt, is the antithesis of science. Science means the sensation of belief, or knowing. Doubt means the absence of knowing. To the extent that we have doubt, we abolish science. What is a valid implication in regard to its doubt is that science is honest—that it never falsely pretends to have the sensation of belief; in other words, that it tacitly recognises that knowledge is solely intellectual sensation of belief, and that it is repellent to the confusion of emotional sensation involving personal preferences with this intellectual sensation. I will conclude this chapter with a few words regarding what we call doubt.

Belief is the negation of doubt, and doubt is the negation of belief. Belief is either positive or negative—that is, it involves either affirmation or denial. There is no such thing as “disbelief.”

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The term is a misnomer arising from nescientific notions of belief. "Disbelief" no more exists than does "disneuralgia." Belief and neuralgia are specific sensations, either there or not there. They have no antitheses. If I believe positively or negatively, I do not doubt. I cannot sit on the hedge within credal conditions and say I neither affirm nor deny. When I say this, I am out of credal conditions and in the realm of "doubt," or intellectual abortiveness. Credal conditions are in the realm of intellectual productiveness. Doubt can only exist as substitute for belief. When doubt is there belief has vanished. Belief means yes or no. Doubt means neither. There is nothing credal between yes and no. We only "know" about anything by experiencing the sensation of belief, positive or negative. When we doubt anything we banish it from the region of knowledge.

The excitants of the sensation of belief, so far as concerns us as individual knowers, are immaterial considerations; in other words, whether our premises and inferences are sound or not, our particular "knowing" is not affected so long as we have the sensation of belief. The conventional distinction between knowledge and belief arises from nescientific conceptualism. When we believe anything, we know, for the time, as we can only possibly know. Perhaps, later, some fresh excitant may qualify the sensation, turning it from positive to negative, or *vice versa*. Still, we have the sensation of belief constituting knowledge. Or, on the other hand, the fresh excitant may abolish

the sensation. Then, we get the neutral or abortive sensation—doubt.

Supposition, involving opinion, usually confounded with belief, is quite another thing. The one is a definite intellectual sensation; the other is a mere vague inclination in one or another direction arising from emotion, habit, personal likes and dislikes, involving the acceptance of one or another alternative. Take an illustration: If I believe a pen to be made of steel, it *must*, for me, be made of steel, notwithstanding that, to a metallurgist, it was made of, say, gold. For me, as believer or knower, there is no alternative possibility. On the other hand, if I only suppose the pen to be steel, I assume two or more probable contingencies, and adopt what seems to me the most plausible, alternative. Here I get no belief, only preference involving arbitrary selection of a probability. So soon as evidence involves belief, it involves, for me, certainty. Then, only, I *know*; and I know as well as it is possible for any individual to know, whether my knowledge is what is conventionally called false or true, or what I call unfit or fit. I know as well as any individual can know, because no individual can know better than as he can feel the sensation of belief. Relatively to other people's, my knowledge may be defective, relatively to myself, it must, on the conditions, be perfect. My own credal "neuralgia" is, for me, the truest sensation of the sort in existence. Nobody else's "neuralgia" affects mine, until it takes its place. Then I get another "neuralgia."

Of course, credal sensations may be of different intensities. The sensation of belief may be stronger in one than in another set of truths, just as the sensation from a spoonful of mustard is stronger than from a fraction of the quantity. In neither case is the essential quality of the sensation affected. The mustard is the same, as quality of sensation, whether we take the spoonful or the fraction. The belief is still knowledge, whether it comes as the "spoonful" or the "fraction." We usually feel immediate intuitions of sense as involving the strongest sensation of belief; still, many people, myself among the number, feel intellectual elaboration of these primary intuitions as stronger credal sensation. Convention, mainly through the confusion of supposition with belief, distinguishes as different things, mere differences of intensity of credal sensation, calling the weaker knowledge belief, and the stronger belief knowledge. Philosophically, the distinction is insignificant. That we call a young dog a puppy does not affect the *thing*. All our knowledge is a relative quantity. Our Galileos are continually turning positive into negative believers, and *vice versa*.

CHAPTER X

LIVING AND NON-LIVING

IN earlier chapters I dealt with various fundamental biological and physical concepts and showed that they were nowise explanatory of vital and physical phenomena, but were merely to be contemplated as more or less logical structures built on imaginary premises projected, as supposititious analogy, as distinct from genuine inference, on sensory experience. In this chapter, I purpose showing how biological concepts of organic development are interchangeable with chemical and physical concepts of interaction, and how physical, equally with biological conceptualism, ultimately implies vitality as an inherent attribute of all we perceive as matter. Moreover, I intend to amplify earlier indications that the concepts of biology imply the creation of matter and thus contradict the concepts of physics affirming the quantitative invariability of matter. Of course, I hardly need remind the reader of this work that my own views regarding matter and life are totally divergent from those with which this chapter

is mainly concerned. Here I state the respective cases as presented from the materialistic standpoints of conventional biology and physics, with the object of showing how the conception of life tacitly assumed as given by biology is also tacitly assumed as given by physics.

Modern biology, like modern physics, in its ultimate character is really spurious ontology. Like physics, it pretends to apply sensory criteria to insensibles, to the extent that it defines imagined insensible dimensions as material entities. On the other hand, unlike physics, it does not apply definite temporal and spatial criteria to its imagined infinitesimals. It is content to deal with these infinitesimals as embodiments, not definable in time and space, of a manifestation which it calls hereditary determinism. This, it supposes to be centralised in certain material particles to which it applies various fanciful designations (biophors, determinants, pangenes, biological units, and so forth). Of course, by its procedure, biology, like physics, merely sets back the crucial question, transferring to certain conceptual factors the enigma of what is sensed. So far as its empiricism goes, showing that a specific cell governs the development of the organism, biology is empirically synthetic. So far as it speculates about material infinitesimals, it emulates the imaginative analogy-manipulation of physics, though it does not proceed to the conceptual extremes of the latter science. Unlike the transcendentalism of physics, bound within the limitations of intellect through its

application of spatial and temporal criteria to the insensible, the transcendentalism of biology, synthetically futile as it is, nevertheless drives us to implication of the supernatural, or something beyond what we perceive as the *phénoménal*. I may say that modern biology has come to explode modern physics.

As already stated, recent biological investigation has demonstrated that all organisms originate from one cell, or from a fusion of the nuclei of two cells. Beyond this, it is proved that a highly elaborate mechanism exists in the nucleus of every such originating cell, and that this mechanism determines the development of the future cell-generations constituting the organism. Prior to these recent researches into the morphology and physiology of the cell, biologists were in much the same position regarding their particular subjects of investigation as were psychologists prior to the recent researches into the morphology and functions of the cerebral correlations of nervous matter. The rivalry between the modern and comparatively antique schools of biology arises from the attempt of the older investigators to reconcile their hypotheses, built up before the recent investigations, with the facts revealed by those investigations. Most of us are ready to fight for our pet notions, originally attained through reason, after they have been demolished by reason. I surmise that certain famous investigators are, in this respect, no exception from the common rule.

Biologists have arrived at a conception, in regard

to organic matter, analogous to that arrived at by physicists in regard to inorganic matter. According to current biology, certain units condition the development of the physiological organism, and the most primitive physiological organism was an undifferentiated cell, or, we may assume a cell composed of a few units. According to the logic of biology, after one such system of life-units had been formed, those units being unalterable, no extraneous influences could affect it, beyond destroying it as a system, that is, beyond disintegrating its units, or according to our common terminology, killing it. On the other hand, so long as it persisted as a system, it would have the power to combine with another system, perhaps differentiated as to components, but similarly composed of biophors, or life-atoms. The product of such combination would be a more complex organism with more varied function. By this process of combination of systems we should ultimately reach the conception of a highly differentiated "germ-cell," such as is pictured by Weismann.

On the conditions stated above, the primitive cell must have contained fewer units than does the germ-cell, say, of a human organism, because a man, as the product of such a germ-cell, is a vastly larger and more complex organism than, according to our experience, proceeds from a primitive cell, which merely divides into two identical cells. Consequently, if extraneous influences do not hereditarily affect physiological systems composed of biophors, a human germ-cell

could only have arisen, according to biology, through combinations among more primitive cells. This, I may say, is an assumption divergent from Weismann's theory, which illogically affirms the hereditary effect of extraneous influence on the germ-plasm of primitive systems, while denying that effect on later systems, and attributes primitive variability to that influence. Now, as cells individually divide into two cells, their units must likewise divide, and if they divide they must, according to the logic of biology, form fresh matter. On the other hand, as vital units, they are biologically postulated as being as individually unalterable as physical atoms. Then, we must grant that extraneous influences could not affect these biophors. But they form new matter, as themselves, by multiplying. Whence does it come? From food? But food is an extraneous influence. If unalterable units could transmute food into their own bodies, then as earlier emphasised they would become altered by the foreign potentialities comprised in the food. Consequently they would be altered by extraneous influences, and as they were altered, the complex systems of which they were the hereditary constituents would be hereditarily affected by extraneous influences. On the other hand, if they, as material elements, multiply without transmuting food into their own organisms, the fact contradicts the dictum of physicists that whatever matter is now in the universe was always there.

Every organism, plant, or animal passes through various stages of development, starting from an

individual cell and, to a certain point in its life-cycle, increasing in bulk and complexity through the divisions of successive generations of cells. What is not so well known is that all the processes of assimilation by which such an organism thus increases in size and complexity depend on two faculties with which every cell is endowed, viz. the faculties to respire and assimilate. The former is a destructive process called by physiologists catabolism, the latter is a constructive process termed anabolism. So long as the balance of effects of the latter exceeds that of the former process, the organism, whether an elephant or a cell, functions as a growing matter-system. So soon as the balance is in the opposite direction, the organism functions as a decaying matter-system. As each of the multitudinous types of organism which people or have peopled the earth, broadly speaking, has or had a well-defined limit during which these opposite processes would operate, it is manifest that a determining influence has conditioned the life-cycle of every such type. Biologists now show that this determining influence, as a phenomenon, issues from the constituents (biophors) of the primitive (germ) cell of each individual of the type, and that, when the duration of the processes is modified, involving the premature "death" of the organism, the interference occurs through what we call accident. In this sense, the slaughter of organisms, whether through, say, an earthquake, microbic infection, or the injustice of man to man, involves the accidental death of such organisms.

According to biology, a certain number of biophors conditioning a sexual cell, and formed of matter, in the materialistic sense, cause the cell to multiply in determinate directions until the bulk of the original cell, and corollarily, according to biological implication, the original number of biophors is vastly exceeded, and a complex physiological structure ensues. It may be urged that the phenomena of growth afford me no logical ground for maintaining my proposition, as biological postulate, in regard to the creation of matter by biophors, inasmuch as there is no logical necessity for my implication that the biophors originally constituting the germ-cell of an organism have multiplied *pari passu* with the cells of that organism. Such an objection would involve that the number of biophors necessary to condition cell-multiplication existed at the origin of the germ-cell, and that all the physiological processes of assimilation and growth ensued merely through the transmutative activities of an ordered succession of pre-existing biophors or integrations of biophors, such as are postulated in current theories.

Though the above suggestion might meet the case of individual growth through cell-multiplication, it would not touch the question of procreative continuity of cell-systems or what we call organisms. These biophors not only cause the development of the specific physiological structure, they also supply that structure with new generations of biophors which, at a certain time, shall enable that structure to propagate another structure, and so on indefinitely.

Thus, the assumption of non-dividing biophors will not meet the case of procreation, however it might meet the case of individual growth, and so cannot be advanced against my proposition, according to biology, of the matter-creating capacity of biophors.

According to biology, physiological structures increase in bulk through incorporating non-living matter and transforming it into living matter. On the other hand, according to the logic of biology, biophors cannot be modified by extraneous influence, and extraneous matter, as food, would be such an influence. Therefore, biophors cannot transmute food into their own bodies. Let us examine the bearing of this proposition on specific organisms. As biophors cannot be affected by extraneous influences, and as biology says that these biophors, through a complicated process of ordered co-operation as the germ-nucleus, condition the hereditary development of the organism, then the posterity of such an organism cannot be hereditarily affected by any outside influences acting on the parent. This involves what is called the continuity of the germ-plasm, but does not involve that extraneous influences such as food, climate, social and other surroundings may not radically affect the development of the individual organism. That such influences do affect the individual is, of course, a matter of common experience.

Still, in the above case affecting the individual, there is no hereditary effect. Though the individual may "accidentally" decay, his or her sexual cells retain unimpaired their capacity to condition a future

organism by transmitting their hereditary quality, subject, of course, to admixture with the hereditary quality of some other germ-cell and thus constituting sexual procreation. Thus, though extraneous influences largely condition the development of the individual, they do not, according to biology, affect the type, morphologically or physiologically. The reason that environment does not affect the type is that food which, according to biology, could be the only possible hereditary determinant as environment, is not assimilated by biophors, and that these biophors, by implication, create matter, as duplications of themselves, to constitute future germ-cells. What these biophors fashion as tissue, etc., is largely determined by the character and quantity of the outside material they transmute. What they fashion as dividing organisms (duplicates of themselves), and corollarily as generations of sexual cells, is, according to biology, no more dependent on outside material than is the continued existence—according to physics—of the atoms of such outside material dependent on the surroundings of the atoms. Equally with the atoms, biophors are persistent as individual entities. Just as these atoms, when assimilated to form organic tissue, or when composing chemical inorganic combinations, still retain—according to physics and chemistry—their integrity as atoms, so do the biophors, whatever conditions may surround them, retain—according to biology—their integrity. The essential difference between the atoms and the biophors is that the latter can create fresh biophors, while the atoms cannot

create fresh atoms. We may put it that the atoms had their existence, at their origin, limited to their individualities, while the biophors, at their origin, were so conditioned as to be able to renew their existence. Thus, we must infer, according to biology, that the procreatively living did not arise spontaneously from the non-living.

Considerable interest has lately been aroused by the discovery by Dr. von Schrön, Professor of Pathological Anatomy, since 1864, in the University of Naples, of "living crystals," that is, of the fact that various micro-organisms take the crystalline form. An account of this discovery appears in the *Daily Chronicle* of August 7, 1899. The writer of the article, after commenting on the pathological importance of the discovery, remarks: "The second, and perhaps even greater importance of the discovery, lies in the living crystal, this bridge between the worlds heretofore called living—the animal and vegetable—and that hitherto called dead—the mineral. If the discovery stands the test of criticism, and there seems to be no doubt whatever that it will, it may ultimately result in a recasting, to a greater or lesser extent, of all existing views of life, of force, and of the origin of terrestrial matter."

The empirical corroboration, afforded by the discovery, of my contention that all matter manifests life, will be evident. On the other hand, the discovery nowise affects my demonstration of the demarcation of organic from inorganic life. As mere crystals, these microbes manifest the inorganic

form of life. Only as procreating factors do they manifest the organic form. That they take the crystalline form, no more affects my distinction than does the fact that other organisms take, say, the human form. The essential division between the two forms of life lies in the existence, in one, of the procreative faculty, and in its absence from the other. As crystals, these microbes manifest what I may term inorganic soul-fiat. As procreative agents, they manifest organic soul-fiat. At root the discovery has no more bearing on the problem of life than has any ordinary form of crystallisation which always offers vivid illustration of inorganic life, or soul-fiat, lacking the procreative peculiarity of the organic.

According to the logic of biology, biophors do not transmute outside matter into their own bodies, but multiply through inherent potentiality. Thus, they represent the essential difference between what we understand as organic and inorganic products of evolution. They are the only entities, to our apprehension as biologists, which directly transform "spirit" into concrete substance—otherwise the immaterial into the material. All other atoms, though like these life-atoms or biophors inscrutable (to scientific empiricism) as to their origin, and endowed with specific potentialities, have no capacity to elaborate the material from the immaterial. According to biology, biophors are to be considered the soul of the organism, and when they leave it what we call death ensues. When this occurs, the adventitious constituents of the organism, derived

from inorganic matter, through the physiological processes of assimilation, also revert to their non-physiological state, becoming again inorganic. Now, if these biophors thus transform spirit into matter, as themselves materially, it may be asked what becomes of the matter they created as themselves, apart from that they merely transmuted? Does this also disappear? I reply that, according to the biological definition of biophors, the created matter disappears from the phenomenal universe. If it did not thus disappear, those biophors could not leave the organism, and, if they did not leave it, the organism could not "die." Thus, biologically, we arrive at the proposition that not only is matter continuously added to the universe, but that matter is also continuously disappearing from the universe.

Let us now turn to the conventionally non-living. What is apparently destined to become the most important method of interpretation of chemical phenomena is the application to them of the principle of conservation of energy. What is called Thermal Chemistry postulates that all chemical transformations are resolvable into the absorption, or dissipation, of energy, in the shape of heat, and that these processes of absorption and dissipation ultimately depend on the masses and inherent motions of atoms. This method of interpretation, in my opinion, will develop into the application of the biological conception of hereditary units, to chemical atoms. Certainly it involves a complete repudiation of the physical concept of mass-inertia,

inasmuch as it attributes to each atom a specific endowment of inalienable energy, thus constituting the atom an "hereditary" unit. Whatever thermal or other manifestations accompany chemical changes must be dependent on the "innate" tendencies of these atoms, just as morphological and physiological manifestations are dependent on the innate tendencies of biophors. Like biophors, these chemical atoms (contemplating them, as we now are, from the materialistic standpoint), through affinities involving selection among themselves, become integrated into what I will term inorganic cells (molecules), and, by a process which I may compare to cell-conjugation, I submit that these inorganic cells (molecules) constitute inorganic systems, the analogues of physiological organisms. As the latter are conditioned by their biophors, so are the inorganic systems conditioned by their atoms. Thus all chemical combination of elemental atoms to form molecules, though not involving such typical fixity as in the case of biophoric combination, is analogous, as being a strictly selective process, to biophoric combination involving primitive cells. Such primitive biophoric cells would vary according to the selection (at the evolutionary appearance of such cells) issuing from differentiated biophoric affinities, and this process, at later evolutionary stages, would be repeated among cells themselves, involving what biologists term conjugation. Ultimately, it would be manifested as sexual selection. But, while the *type* of a biophoric cell would become, according to the evolutionary age of such

type, more and more insusceptible of modification through selection, the *type* of an atomic "cell" (molecule) issuing through the selection of inorganic atoms has been throughout all evolutionary time, liable to alteration through "extraneous influence" involving changed apposition between the atoms of such molecule. In other words, the atoms of a non-physiological system may continuously alter their selection and issue as typically changed systems, while the selection among atoms of a physiological system fixes the type, as what we call generations, so long as that system normally persists and can renew itself as fresh organisms. Nevertheless, the process of selection among units is, fundamentally, equally determinate of the type, in the case of a non-physiological as of a physiological system. To illustrate these points: A system called a human germ-cell, so long as it acts procreatively, will not change its type, as human, nor will its posterity change theirs. Again, procreating germs of a horse and an ass produce a mule, partaking of the qualities of each parent. On the other hand, the "posterity," say, of powdered iron, under the contingency of mixture with powdered sulphur, and subject to the application of heat to the mixture, will be, typically, entirely different from iron. No scrutiny can detect the slightest trace of iron in the "posterity" now called sulphide of iron. The same may, of course, be said of the "posterity" of the sulphur. The types, in both cases, have disappeared. Here, then, we have biological hereditary units preserving the systemic

type, notwithstanding admixture, and chemical "hereditary units" annulling the systemic type through admixture. In the product of the horse and ass germs, we have horse and ass quality. In the product of the iron and sulphur germs, we have neither sulphur nor iron quality. The chemical molecule is here the analogue of the biological germ-nucleus, or, roughly, germ-cell.

These "cells" (molecules) of sulphide of iron fulfil a similar office in building up the "body" of the mass of sulphide of iron, to the office of those cells, composed of a number of molecules, which build up the soma of the physiological system. This, moreover, involves that non-physiological "cells" (molecules) as forming "somatic" cells, or the cells of physiological structures, fulfil an office as constituents of the physiological cell, analogous to the office of the latter in respect to the physiological organism, or multicellular structure. Like the multicellular physiological structure, the "multicellular" (molecular) non-physiological structure, as, say, a mass of iron, or sulphur, responds to its environment. However, unlike the physiological structure, the iron, or sulphur, may have its atomic elements so readjusted by environment as to cause the iron, or sulphur, "organism" to lose its typical identity. On the other hand, whatever be the environment of the physiological structure, and though this structure may become superficially modified by environment, it does not lose its typical identity until its somatic and non-somatic elements revert to non-physiological

states—that is, until what we call life has left the structure. Of course, to a certain extent, this is also true of the iron, or sulphur. Either may be considered to “die,” so soon as it becomes transmuted, through readjustment of its atomic elements, under the stimulus of its surroundings. Looked at from this standpoint, we may consider chemical changes as equivalent to the “death” of non-physiological structures, and, of course, to the “birth” of new ones. Thus, non-physiological, unlike physiological “birth,” does not involve typical continuity. If a new chemical organism is “born,” this involves not only the “death” of the “parent” structures, but also that the “offspring” shall be typically different from the “parents.”

Now, it is evident that, as the type of a non-physiological, “multi-cellular” (multi-molecular) organism, say a lump of iron, is liable to change through selective (chemical) changes among its “cellular” (molecular) constituents (atoms), and, as these selective changes involving typical alteration will inevitably occur as soon as there is suitable contiguity between this organism and another, involving the stimulation into active manifestation of certain affinities “innate” to the atoms of these structures; and as, on the other hand, a physiological structure, no matter what other organisms may be near it, is not liable to typical change through selective changes among its cells, nor are these cells themselves, though having non-physiological molecules for constituents, liable to typical change, then it is evident that

physiological cells and their constituent atoms and molecules are controlled by some factor radically distinct from any existing in non-physiological "cells" (molecules). This factor is, in biological terminology, the biophor, or life-atom. It alone differentiates the physiological from the non-physiological structure, and prevents the unlimited exercise by the non-physiological units of a physiological cell of those selective affinities which condition non-physiological structures, and are manifested as what we call chemical phenomena.

Chemists are now able to synthesise, in the laboratory, various compounds which are elaborated by physiological cells. Thus, chemists can synthesise urea from ammonium cyanate, and have similarly built up about one hundred and eighty organic compounds. But, although these compounds may be chemically considered identical with the physiological products, they are fundamentally different, inasmuch as they have no vitality. That is, they have not been subject to the action of biophors. As remarked by Professor Meldola at the 1895 British Association Meeting: "All the chemical transformations in the organism—at any rate, all the primary changes—are made possible only by the antecedent combination of the substances concerned with living protoplasmic materials. The carbon dioxide, water, etc., which the plant absorbs must have formed a compound or compounds with the protoplasmic materials of the chloroplasts before starch, or sugar, or cellulose can be prepared. There is, on this view, no such process as the *direct com-*

bination of dead molecules to build up a complex substance. Everything must pass through the vital mill. The protoplasmic molecule is vastly more complex than any of the compounds which we have hitherto succeeded in synthetising. It might take up and form new and unstable compounds with carbon dioxide or formic aldehyde, or sugar, or anything else, and our present methods of investigation would fail to reveal the process. If this previous combination, and, so to speak, vitalisation, of dead matter actually occurs, the appearance of starch as the first visible product of assimilation, as taught by Sachs, or the formation of a 12-carbon-atom sugar as the first carbohydrate, as shown by the recent researches of Horace Brown and G. H. Morris, is no longer a matter of wonderment. The chemical equations given in physiological works are too purely chemical; the physiologists have, I am afraid, credited the chemists with too much knowledge—it would appear as though their intimate familiarity with vital processes had led them to undervalue the importance of their prime agent.”

When, as biological and physical empiricists, we come to look a little more deeply into this distinction between the “living” and non-“living,” we find it, to some extent, arbitrary. Of course, there is a fundamental difference between the two states, as already shown. Nevertheless, the *thing*-difference is not between living and non-living, but between two forms of living. It is irrational to maintain that life does not manifest itself in, say, a molecule of hydrogen,

when that molecule functions as a system. And, assuredly, it does so function as really as does a physiological product. Its constituent atoms, like biophors, have innate energies causing the hydrogen molecule to energise in specific ways which no terrestrial power can affect. Its "volition," manifested in its affinities, is as determinate as that of any physiological product; its response to external stimuli is as determinate. In the light of modern science, we can come to no other rational conclusion than that life, in what we call the inorganic system, is just as real a phenomenon as in what we call the organic. "Mass-inertia" is a myth.

It will be seen that hereditary predeterminism must condition the non-physiological equally with the physiological system. However, while the non-physiological system is "hereditarily" determined by all its atoms and environment, the physiological system is determined hereditarily by only special atoms (biophors), and independently of environment. In other words, environment, in the shape of influence from surrounding matter-systems, on the *soma* of a physiological structure does not affect the posterity of that structure, while such environment does so affect the "posterity" of a non-physiological structure.

Thermal chemistry, as already indicated, tries to interpret chemical transformations in terms of matter and energy, attributing to each atom a specific amount of energy as its "innate" endowment. It will be seen how fundamentally opposed this is to the mechanical hypothesis of mass-inertia, and how strongly it tends

towards the biological and ultimately spiritual interpretation of phenomena advanced in this work. At present, under the influence of the mechanical tradition, chemists are trying to interpret atomic selection involving chemical transmutations, as mere effects of the absorption and dissipation of energy. I think they will soon see the futility of the attempt. Cooke, in *The New Chemistry*, remarks: "But while we recognise in our last analysis mass and energy as the only fundamental elements of Nature, let us not forget that there must be a directive faculty by which atoms are arranged and controlled." This "directive faculty" is the gist of the matter. We may as well try to explain chemical phenomena without taking it into account as try to explain the physiological functions, ignoring the heart.

Let us now depart from the materialistic standpoint hitherto adopted in this chapter, and consider some other aspects of the questions of living and non-living. Gravity, as earlier indicated, is the primary emotion of matter, equivalent to common sensibility, or reflex responsiveness in the realm of the organic. This reflex responsiveness is, ultimately (as will later be shown), volition. So, in the realm of the inorganic, gravity is volition, and by this volition of the inorganic, I mean its power to respond to hypnosis by the human soul, and, through that hypnosis, afford the human organism specific sensations. This consideration I have dealt with in earlier chapters, and shall elaborate in later ones. What we call the resistance, inertia,

attraction, repulsion of bodies is such inorganic volition.

Let me illustrate the above points. When I unsuccessfully try to lift a body, I say the body is too heavy to lift. The proper statement, from our present standpoint, is that the will of the body will not yield to my will, in other words: I cannot hypnotise the soul of matter (revealing itself to me, through hypnosis, as the body) into affording me the sensation of raising it. This, again, implies that I cannot substitute one volition affording me the sensation of lifting, for another volition involving hypnosis affording me the sensation of the body unlifted. If my will to lift could overcome the body's will to resist, as gravity (really my will exciting the body to resist my other will as opposition to gravity), I should lift.

Here we make a preliminary incursion into a sphere I have not yet dealt with—the nature of volition. In the illustration I desire and try to lift, but I do not desire that the body shall overcome my efforts. Still, that the body does overcome my efforts is as much a product of my volition as is my trying to overcome the body. Really my desiring and trying are essentially distinct from my willing. Of course, they are commonly considered all that constitutes the willing. I hope to demonstrate the fallacy of this view in the course of this work, and to show that what we commonly apprehend as a volitional act is always a soul-fiat for motor action and, as such fiat, is always outside our immediate

consciousness. This involves that we can do anything we can will to do, but that we cannot always will what we desire to do.

Reverting to the illustration, there are here two soul-fiats or volitions contending with one another. There is the volition involving hypnosis of the matter-soul into affording the sensation of the stationary body, and there is the volition involving my trying to lift. The former volition prevails over the latter. My desire is essentially distinct from either of these volitions; it is merely the resultant of various external excitations affecting my brain, through my soul, as a particular emotion preliminary to the real volitional fiat involving my effort to lift. The resultant is that all I am effectively able to will is the hypnosis of the matter-soul, involving the object and its gravity overcoming my effort to lift.

The volitions affording sensations of bodies in their permanent characters (as objects of specific contour, colour, density, etc.) involve the "infection" with which I dealt in an earlier chapter. Such volitions and "infections" originate and fix what we call the realities constituting our common objective world of sense. These realities of sense are ultimately typical volitions, involving permanent "personal artifice," or the peculiar interpretation as which the matter-soul, as specific manifestations of "units of stimulus," presents itself to our apprehension. Bodies, in their permanent aspects, are what may be termed type-sensations. We only sensorially appre-

hend bodies *as* these sensations. The reality of these bodies (units of stimulus or soul) we do not apprehend as such sensations, but as other sensations involving resultants of what we call intellectual processes, as inference. This inference, as I show in this work, must always be bound to the type-sensations involving the primary knowledge of bodies.

What we call evolution in the domain of physical phenomena (organic and inorganic) is the evolution of type-sensations. When we first recognise by sense any object, we initiate for ourselves a type-sensation. If the object constitutes common experience, when we first perceive it, we get "infected." If we are the first discoverers, and the object is destined to become common experience, we shall originate an "infection" involving a fresh phase of the evolution of type-sensations. For instance, when Professor Ramsay discovered argon, he originated such an "infection" as a new manifestation of the human mind's power to hypnotise the matter-soul into affording a type-sensation destined to become part of the sensation-organism of humanity. The professor was decreed to call to manifestation a new volition of the matter-soul as response to his own hypnotism. This ultimately means that he himself manifested a new potentiality for fiat in the human soul. Once he manifested it, it became, as the sensation "argon," "infectious," or typical. So has all our sensory experience of externality or type-sensation grown up. As much of it has probably been lost as gained during human evolution. Thus the mammoth would prob-

ably be seen "in the flesh," as a type-sensation, by many of our ancestors "infected" with it as product of their hypnotism of the matter-soul. We cannot so hypnotise the matter-soul, so we say the mammoth is extinct. Some among us, called paleontologists, try to imagine the hypnotism, getting what I may term a bogus type-sensation. At present, I hypnotise the matter-soul into affording me a type-sensation which I call my own body. Sooner or later "I" and this type-sensation will be separated. Still, I conclude that the type-sensation will persist long after I have lost its specific manifestation as my body.

Reverting to the earlier illustration, when we lift a body, one volition involving what we call effort modifies another volition involving the body as being in a state of what we call rest. All the sensations we derive in the course of lifting the body are specific soul-fiats or volitions modifying or superseding those constituting our apprehension of the body at rest. These varying soul-fiats involve the "effective" and "ineffective" "units of consciousness" to which I have incidentally referred in various earlier parts of this work, and with which I shall deal specifically in later chapters.

Thus volition itself is a complex of many specific soul-fiats, and what we commonly consider a volitional act is merely one resultant which we can sensorially apprehend as a motor manifestation. Let us now consider a rather different effect from that above dealt with. Suppose I try to tighten a violin string

and it breaks. Here I want to do something and fail through overdoing it, or acting too energetically. My wanting has nothing to do with my willing, except as emotion exciting it. Here, I have overcome the will of the string to cohere, that is, I have substituted for one hypnosis of the matter-soul affording me the sensation of the intact string, another hypnosis affording me the sensation, incidentally of spatial intersection, and, what we are now concerned with, the ruptured string. Here my volition was to overdo what I desired, as in the lifting illustration, my volition was to underdo what I desired. In the one case I desired more ; in the other case less than my volition accomplished. In neither case could I here will what I desired.

Thus, the willing of the non-living, so far as we apprehend it, is really our own willing. What biology, chemistry, physics deal with, as physical entities and their interactions, are really what we will into the matter-soul and experience as interaction with it. Of course, it is not easy to conceive, say, a boulder as merely the creation of our wills. But the difficulty is lessened if we think of the boulder, as it obviously must be, as an impression within ourselves, as well as something outside ourselves, and keep well in mind the obvious fact that we can only apprehend what is within our own mind, and that if the boulder exists as anything out of our mind, we can only know it inferentially, not as the boulder we perceive by immediate intuition. A boulder is no doubt a very solid something, and a gas is a very impalpable

something, but the solidity of the one no less exists inside our mind than does the impalpability of the other. Dr. Johnson might just as well have waved his hand about in the air and offered his comment in that connection, as in the case of the kicked stone. Whether we get our sensation from a stone or a gas does not affect it as being sensation.

CHAPTER XI

INORGANIC CONSCIOUSNESS

IN the preceding chapter, I affirmed, as ultimate truth, that all our knowledge of external phenomena, as sensorised interactions of bodies, and as bodies themselves, was essentially knowledge of our own internal or mental interactions involving soul-fiats hypnotising the soul of matter into affording us specific or type sensations. I showed that, by another psychical process involving what we call intellect, we were able to transcend this immediately intuitive or sensory apprehension of phenomena, and I hope I have rendered clear in this work that we can only attain such transcendental knowledge by so applying the intellectual factor as to involve a logical sequence of truths genealogically bound to the products of sensory intuition.

I have also indicated that the intellectual factor is an evolutionary superposition, essentially distinct from the sensory factor, towards which the intellectual factor may be regarded as a neutral observer of events to which it applies sequences of sensations peculiar to

itself involving the perception of significance as distinct from mere occurrence. I indicated that intellectual and sensory processes ultimately depended on soul-fiats so conditioning the organism as to involve specific sensations, and that these soul-fiats involved what we call discovery, invention, products of handicraft, etc. etc. I indicated that, in all such cases, we hypnotised the matter-soul to afford us the respective sensations which we call discoveries, new appliances, and that every common product of handicraft was as much the result of these fiats as were the new inventions discoveries. These points I hope to render clearer and fully to establish in the course of this work.

What we call imagination are really intellectual soul-fiats not bound to the sensory type of fiats, as sequences affording us the experience of what we call logical consistency with the sensory series of fiats, but essentially foreign to, or independent of the sensory series. As series in themselves, these imaginative fiats may be perfectly consistent. Only in relation to the sensory series, as sequence, are they necessarily inconsistent. When, on the one hand, we contemplate intellectual fiats bound to those of sense, and on the other hand contemplate imaginative fiats disjunct from those of sense, we experience a sensation comparable with that involving spatial intersection between objects of sense. We recognise a psychical rupture or void, in the latter case, between our sensory and intellectual cognitions, while, in the former case, there is no breach—the sensory merging into the intellectual by sequence affording us sense of perfect continuity.

The question with which this chapter is concerned (inorganic consciousness) is, from the standpoint above indicated, not susceptible of completely satisfactory solution. If all we know is our own sensation, then, if any sensation exist outside our own, we can only know it *as* our own. On the other hand, assuming, as I propound, that we hypnotise the matter-soul into affording us varied sensations, matter must manifest changes corresponding in some way to our sensations. Always assuming that matter does really exist, as something not ourselves (this point I have established in earlier chapters), it must be an active agent of some sort to enable it to respond to our hypnotism. If one body affords me the sensation of iron, another of wood, assuming these bodies represent anything not myself, I submit I am inferentially driven to attribute to the underlying matter-soul a susceptibility, predisposition — call it what we may — in some way corresponding to my consciousness of its varied response as the respective bodies. Really, my grounds for affirming this correspondence are hardly less valid than those for affirming other consciousnesses than my own. I have no immediate experience of the consciousness, as distinct from the body, of my friend. Beyond sensing his body, I only really know inferentially that he exists. His body is not he, nor is my body I. I notice varied motor responses on his part and infer he has a consciousness such as I feel my own and perceive to be manifested by motor responses analogous to those of my friend. Really, I hypnotise his body into affording me its sensations,

as fully as I hypnotise the iron and wood into affording me their sensations, and I am really as dependent on the hypnotism for knowing my friend as for knowing the iron and wood. I infer that my friend has a consciousness, from the premise that I have one, but I only know him to exist by hypnotising his body. Really, I only know myself to exist through the same means applied to my own body. My friend's consciousness does not tell me he exists, any more than the consciousness (if there be one) of the iron or wood tells me it exists. Indeed, I think I demonstrate in this work that I have only inferential knowledge even of my own consciousness—that the essence of "me" is really unconscious, and that I derive the notion of my own consciousness rather from specific concrete interactions than from any immediate intuition of the consciousness.

On the above grounds, I venture to adopt the assumption that what I feel regarding matter is what I may term a replica of something occurring in the matter, as response to my hypnotism, and, corollarily, that if matter appears to me to exercise attractions, repulsions, differentiations, it manifests a consciousness *sui generis*. That matter does so discriminate is the most obvious fact, to us, in its existence. Every chemical transformation is an example of such discrimination. Of course, what we apprehend specifically *as* this discrimination, or chemical change, is our own sensation derived through hypnotism of the matter, but this does not preclude the action of a part by the matter, as soul. It may perform a rôle

as well as we. The hypnotised human subject acts his part and exercises discrimination, however automatically he may obey the hypnotist, and it is well known to alienists that hypnotic influence may be exerted unconsciously. Indeed, I maintain that the major part of life is conditioned by unconscious hypnotism. I have indicated this position, in regard to common affairs, in an earlier chapter dealing with what I term personality-fetichism (chap. x. vol. i.).

The hypnotism we exert on the matter-soul is, of course, unconscious. So far as we are consciously aware of it, we can only be so indirectly, through inference from the intellectual sensation that we can know nothing outside our own mind, and that if anything exists outside our own mind, we can only know it as constituent of our mind. Even God, as a conceived entity, we can only know as existing in our mind and as evolving or changing with the evolution of our mind. Still, our mind tells us that God is not ourselves, as it tells us that what we perceive as bodies—even our own bodies—are not ourselves. Our mind tells us that we could no more conceive matter if it did not exist as not ourselves, than we could conceive God if God did not exist as not ourselves. To conceive anything we must interact with it. We do not interact with our own soul, so we cannot conceive it, except as I demonstrate, as the negation of perceived activity, or as unconsciousness governing consciousness or our perceived activity. Because our soul interacts with our body, we are conscious of the latter, but our body, as interacting

with our soul, can afford us no such consciousness of our soul, as our soul's interaction with our body affords us of our body. This occurs because any consciousness we could derive through the mere activity of our body would be simply the consciousness of inorganic matter, which would not at all be what we recognise as consciousness in ourselves. We conceive our body's interaction with our soul, not through the body's activity, but through the soul's. Likewise, we perceive our body's actual existence, not through its own activity, but through the soul's, and we cannot so perceive the soul's actual existence because the body depends for consciousness on the soul, and, to afford us actual experience of the soul, would need to be independent of it, as agent affording consciousness.

For analogous reason, we cannot actually perceive God, as we can perceive our own body. God being to our soul, as that is to our body, our soul can no more afford us direct experience of God than our body can afford us direct experience of our soul. Thus, for analogous reason, we can only conceive God's existence, as we can only conceive our soul's existence. By conceiving, I here mean entertaining a mental picture, not merely experiencing the vague intuition underlying all conception, and through which the savage derives rudimentary knowledge of God and soul, as I have earlier shown.

Thus, we must interact with matter before we can conceive it, as we must interact with God before we can conceive God. That we interact, necessarily

involves something acting as well as ourselves. That we interact with matter involves the action of matter as well as of ourselves, as, that we interact with God involves the action of God as well as of ourselves. If God merely created us and ceased acting on us, assuming we could exist, we could not conceive God. Similarly, if matter merely existed, without acting on us, we could not conceive matter. Accordingly, that we hypnotise matter, involves that matter does something as fully as we do something. If matter did nothing, could we even hypnotise it, we could not perceive any effect as constituting matter. If we could not perceive the effect, there would be no matter for us.

Looking at this question from the common materialistic standpoint of science and ordinary experience, the fact of inorganic consciousness is almost too obvious to need argument. Everything we perceive of matter is evidence of the fact, if we only discard the spectacles of prejudice and superstition. Let us contemplate the question, for a moment, from the standpoint of common experience. In discussing the X-rays in an earlier chapter, I contrasted the perceptivity of a photographic plate with that of a human brain, as a visualising factor. From our present standpoint, the consciousness of the paper is just as real as that of the human organism. The difference is not in essence, but in degree. To take another illustration: Why should we posit that our consciousness of, say, a black object, directly visualised through air, is real con-

sciousness, but that the consciousness of a mirror, through which we indirectly visualise the black object, is spurious consciousness? The reply may be : We get a sensation from the object ; the mirror gets none. How do we know this? From our present standpoint, I maintain we know nothing to invalidate the claim of the mirror to a consciousness as real as our own, if of a different character. From our present standpoint, the fact that we derive a sensation from the mirror, involving the picture of the object, is good evidence that the mirror responds to that object. Moreover, as the mirror affords us the same sensation as we derive directly from the object, there is, from the present standpoint, good evidence that the mirror responds to it as we do. That we call our response seeing, and the mirror's reflection, is, in the connection, a mere matter of arbitrary distinction. From our present standpoint, we have no real ground for denying that the mirror forms its own idiosyncratic version of the object. Therefore the mirror perceives.

On our present conditions, the only way we could demonstrate that the mirror did not perceive would be by demonstrating that it did not respond. This would be impossible to us. All we could demonstrate would be that we could, or could not, as the case might be, ourselves perceive a response by the mirror ; in other words, certain "units of stimulus" from the mirror would, or would not, as the case might be, issue, in us, in "effective units of consciousness."

But it may be urged, assuming the mirror perceives, we have caused the perceptivity by constructing the mirror. Undoubtedly, we have constructed the mirror; but we have done this through the effects on ourselves of the "minds" of its constituent glass and mercury hypnotised, as indicated in earlier chapters, by our soul. We have been the relative cause of the mirror's existence. Our mind has fashioned the mirror's "mind." However, inasmuch as our mind needs accounting for as much as does the mirror's, if a Supreme Mind needs invoking as the cause of our mind, then the mirror's "mind" is as much the product of that Supreme Mind as is our mind, and our mind is no less an instrument and, essentially, no more an active agent than is the mirror's. In fashioning the mirror we have responded to Supreme Mind in a manner analogous to that in which the mercury and glass of the mirror respond to our mind. Accordingly, in reality, the mirror's "mind" responds to the Supreme Mind as does our mind, and we are as much instrument, in contradistinction to initiative agent, in fashioning the mirror as it is in answering the purpose for which we constructed it. Thus the mirror's "mind" is put into it by the Creator as fully as our mind is so put into us, and we have no more created the mirror's "mind" than it has created ours. This applies, as already indicated, to every discovery and invention. The appliance we construct manifests "mind" as the effect of Supreme Mind on ourselves. We are instruments, like the appliance. Whether it be the

man who invents a chipped cutting flint, or he who invents a telephone, the issue is the same—"mind" in the appliances created by Supreme Mind through the medium of human mind. The man is no more, essentially, *doer* than is the flint or telephone.

Again, as remarked in the last chapter and to be further elucidated in later chapters, what we call the attributes of inert matter, as weight, resistance, gravity, etc., are really manifestations of will, equivalent to what I demonstrate as soul-fiat in the organism. Because we can apprehend this inorganic "will" as a constant manifestation, we project it as an abstract from the body itself and apply to it various quantitative and qualitative concepts. On the other hand, as we cannot identify such constant manifestation in connection with our own individualities, we do not attempt qualitatively and quantitatively to measure our own wills. We say a certain body's "will" is so many "pounds" in "weight," when we say the body weighs so much; but we do not say our own will, when we move the body, is "heavier" than the body's. Yet, if the body's "will," as resistance, or gravity, represents so many pounds, when we overcome that resistance, our will is manifesting some resistance "heavier" than the body's. Assume a being as capable of identifying constancy in our wills, as we are of identifying constancy in the "wills" of inert matter, that being might apply standards to our wills, analogous to the numbers and weights we apply to inorganic "wills."

Whether in an organism, or in inert matter, will is nothing but the manifestation of potentiality for determinate action or inaction. If God exists, as Creator, then, whatever manifests idiosyncrasy—and everything in the universe, to our apprehension, does manifest idiosyncrasy—represents God's will. Corollarily, if an organism has a special will of its own, so has an inorganic body. Everything proceeding from God, nothing can be dead, in the conventional sense involving the notion of matter as inert stuff devoid of excitability and idiosyncrasy.

On the other hand, nothing can be spontaneous, in the sense of having uncontrolled potentiality for action or inaction. If we could find two identical organic souls and could submit their resulting bodily systems to identical conditions of stimulation, we could only postulate complete identity in their bodily and mental responses, just as we find that identity in regard to inorganic systems, in which we can perceive such identity in "souls" and stimulation. Because the conditions do not hold in the case of the organic, many of us rush to a conclusion attributing complete inconstancy or spontaneity to such systems. As we really fabricate what we perceive as the identity in the case of the inorganic souls, we necessarily perceive the constancy in manifestation, calling it invariable law of the inorganic soul, instead of our own soul. As we cannot fabricate identity in the case of our own souls, some of us jump to the conclusion that their activities are outside law. If we remember that what we call the laws of the inorganic

are really laws of our own sentiency, we shall see that there must be equal inconstancy in the realm of the inorganic as there is in our apprehension of that realm. For instance, it was once a "law" of the sun to revolve round the earth. Now the law is reversed. The "law" only exists because we believe it to exist. When we cease believing it to exist, it ceases to exist. Corollarily, judged by their "laws," the sun and earth are as inconstant, in regard to their relative movements, as are our perceptions of them. They can afford us varying sensations of their "volitions," as we can afford one another such sensations of our own volitions.

As further illustration of the above points, I will quote from my work, *Rhythmic Heredity* (Williams and Norgate): "Suppose we suspend an india-rubber tube, filled with sand, from the ceiling. We grasp the free end and cause the tube to swing to and fro. It describes curves. Let us stop it, and, by a sudden jerk, cause a bulge. This runs up the tube and back to the hand. We might cause many similar bulges to divide the string, by a succession of jerks; but, mark, we could not raise a bulge which did not represent an aliquot part of the length of the tube. Here are wave-motions expressing in visible rhythms what we conceive as 1, 2, 3, 4, 5, etc. . . . This tube, within limits, can form abstractions" (or its own presentation of them) "as effectively as can men: its '1, 2, 3, 4' is as accurate as ours" (p. 130). Again, "We will now employ an instrument called a monochord. We will cause its string, as we did

the tube, to form bulges, which, however, on account of the shorter length and fineness of the vibrating string, we shall not so readily perceive. If we twang the wire or string of this monochord, we hear a certain musical note, according to the length and tension of the wire. If we then place a movable bridge (part of the instrument) under the central part of the stretched wire, and again twang it, we produce the octave of the first sound. Then, the wire is practically in the state of the india-rubber tube when it divided, through our jerks, into two bulges. . . . As every musician will tell us, and our own experience, if we have normal auditory faculty, will confirm, the octave is the most readily assimilated of all musical intervals. Every normal child, in repeating an air hummed by an adult, will sing it an octave higher. Every non-musical person who thus repeats an air will sing it, if not in unison, an octave higher or lower. . . . Continuing our experiment with the wire, or string, we find that a division of a third gives the fifth higher sound than the fundamental. Musicians will tell us, and our own ears if they are fairly efficient will confirm that the first tone combined with its fifth, form, after the octave, the most perfect concord : that is, the harmonic combination with which we can most readily synchronise" (p. 135).

Here we find matter behaving in a manner analogous to our own. To our apprehension, it "perceives" in regard to number and sound what we perceive. It will only select its special "preferences," whatever we do to vary its activity. Contemplat-

ing from the ordinary materialistic standpoint, this matter is just as spontaneous as we are. It will no more do what it does not "want" than we will. It "likes" 1, 2, 3, etc. and concords, as we like them. Looking at the question from the philosophical standpoint, what here occurs is that we can only *will* or hypnotise the respective bodies to afford us special sensations, no matter what we may *desire*. Our will is really as much controlled as is the "will" of the bodies when we cause them to move.

APPENDIX

NOTE A

“ALL aggressive warfare is ethically unjustifiable” (p. 30). Aggression is not here implied in the ordinary sense of mere initiation of hostility. Such initiation does not constitute aggression, provided the incentive is ethical—that is, to enforce justice. Thus, in the case of the Turkish atrocities on Christians, had any Power actively assailed Turkey to suppress the injustice, the attack would not have been aggression in the present sense. The real aggressor was the Power affronting justice. So, in the case of a demolition, on behalf of justice, of private property not strictly arising as reward for service to the community—there would be no aggression in the sense now implied. The real aggressors would be those who opposed the demolition. No aggression, in the present sense, exists where the motive is to establish justice. On the other hand, this justice must be intellectually established, not a mere product of individual or national idiosyncratic preference. To illustrate this, take the present South African complication. One of the early reasons (since abandoned) assigned for interfering with the Boers was that they did not afford voting facilities to foreigners. Here, justice was not a motive, so there was no ethical reason for interference which, on the conditions, would be aggressive.

The mere power to vote has nothing to do with justice itself, but merely involves power to enforce or prevent justice. Until we know how the power is to be exercised, it has no relevancy to justice. It may be exerted quite adversely to justice. In England, the franchise is exercised hardly at all on behalf of justice, but almost entirely on behalf of class and partisan interests and prepossessions, and the object of those foreigners who wanted the franchise in the Transvaal was not justice, but to render predominant their own interests. Accordingly, there was no ethical reason for interference with the Boers, by this nation, on the ground of the franchise, unless this nation intended to enforce justice by means of the franchise. As it does not enforce justice by means of its own franchise, of course there would be no likelihood of its enforcing justice through the franchise in the Transvaal. The people here who cried for justice as being identified with the franchise for Outlanders, confounded justice with mere machinery which we in this country had selected, not to enforce justice, but as affording the best means of enabling conflicting interests mainly anti-ethical to voice their special concerns. Thus, these people confounded their own prepossessions in favour of a particular means, with the ostensible object of the means, which object (justice) the means, as exercised among themselves, had totally failed to assure.

From the ethical standpoint, the only possible object of aggression is justice. Persons, *qua* persons, from the ethical standpoint, have no *status* as objects of aggression. They are merely machinery to be altered, preserved, abolished, according to its adaptability or inadaptability to the maintenance of justice. The individual or nation has, ethically, no rights except those consistent with justice, and is always aggressor so long as he or it does not manifest in action the consistency. Thus, offensive action on the part of the individual or nation is always non-aggressive provided it be on behalf of justice, and is always aggressive unless it be

on behalf of justice. In the latter case it necessarily involves the application of force for the purpose of national or individual aggrandisement, instead of for the purpose of establishing justice.

NOTE B

“The real master is slave of his intellect, by constituting it the master of his emotions” (p. 33). It must not be understood from what I write in the above passage, or elsewhere in this work, regarding emotion and sentiment, that I undervalue their benevolent exercise. All I wish to impress on the reader is that emotion is intrinsically foreign to morality, except as motive force impelling to the exercise of justice and honesty. This exercise constitutes all morality. Emotion only enters the moral realm so soon as emotive exercise supports or opposes the exercise of justice and honesty. Obviously, emotional inclination to exercise justice and honesty must exist, or the exercise cannot exist. This point I have elucidated in discussing philosophy in the first chapter of the present volume. I showed that philosophy, as an abstract system, divorced from belief in an Authority superior to right itself, must fail to inspire the emotion essential to the practical execution of moral discrimination. What I mean by constituting intellect the master of emotion is that intellect shall decide what emotional preferences are morally right and wrong. (I include all sensual predisposition—that is, all predisposition excluding intellectual discrimination—whether we call it appetite, passion, sentiment, emotion, liking, affection, under the one term—emotion. This covers the whole range of the animal, as distinct from the peculiarly human, psychic function, which latter is solely intellect.)

We need no supernatural sanctions or exemplars to tell us that the exercise of kindly emotion is good and its

opposite bad. Our innate selfishness at once causes us to value the one and loathe the other. Everybody likes to be benefited, and feels himself benefited by the exercise of kindly emotion. Nobody feels benefited by unkindly emotion. For virtually the same reason as he dislikes castor-oil and likes tea, a man dislikes malevolent emotion and likes its opposite. But his liking no more constitutes morality as a quality of the benevolent emotion than of the tea. Only so soon as the intellectual criterion is applied to the emotion does the latter acquire moral quality. In deciding the moral quality of the emotional manifestation, intellect solely concerns itself with the bearing of the manifestation on justice and honesty, because these are the only factors about which modern humanity is able to attain genuine belief regarding their essential goodness or badness. In scrutinising honesty and justice, intellect discovers that they embrace all scientifically demonstrable goodness. Intellect has nothing to say for or against emotion, except in so far as emotion affects honesty and justice.

All exercise of emotion involves self-gratification. Whether the emotion impels you to sacrifice or to be sacrificed, it is equally self-gratification. There is no human possibility of absolute self-abnegation. The nearest possible approach to such abnegation is the gratification of the emotion to obey the intellectual ideal of justice and honesty. In this submission, you subordinate the animal characteristics to the purely human characteristic. Then, you illustrate the highest development which humanity has yet attained. Then, and only then, you are a real man.

Let me illustrate the above points. The emotion impelling us to inculcate kindly sentiment in the minds of children is a good thing, judged by our likes and dislikes; but, on the conditions, intellect has nothing to say for or against this emotion. Now, let us go a step further. Intellect says that lying is essential evil. As intellect says this, every normal man must believe it, because through

intellect alone he gets belief. If the man is honest, he will act as he believes. Now, suppose our emotion to inculcate kindness in the minds of children is manifested by imposing falsities regarding a man-god, on those children—then, intellect has something to say about the emotion. Intellect denounces this manifestation of emotion, as involving all the essential evil known to humanity—mendacity and injustice.

Again : The emotion impelling us to relieve suffering is a good thing, judged by our likes and dislikes, inasmuch as nobody wants to suffer. But, on the conditions, intellect has nothing to say for or against this emotion. On the other hand, intellect says that aggression is wrong. So, if my emotion impelling me to relieve suffering also impels me to do so by forcibly taking what I believe to be the rightful property of another man, intellect says that the exercise of my emotion involves injustice—almost all the moral evil existing in the world. So soon as the emotion to relieve suffering, in exercise affronts justice, the emotion involves essential evil.

NOTE C

Regarding my remarks on pp. 36-38, discussing confiscatory schemes, it will be obvious to the reader that my doctrines necessarily imply confiscation, wholesale. I only object to the motive at present influencing the advocates of confiscation. To me, the motive is the all-important consideration. I am not going to be a robber, by vote, to gratify my benevolent inclinations—to say nothing of my rapacious inclinations. Rather I would be a robber, by hand and arm, to satisfy my hunger. That would appear to me to involve the better justification and the more manly action. But I do not want robbery at all. I want justice, and I want confiscation because it is essential to justice.

I care not by what means or measures the readjustment is effected, though I incline to a radical alteration of income taxation, equalising burdens, as a preliminary, to be followed or accompanied by the extirpation of all parasitical or non-productive vocations (finance, in most of its aspects). The reorganisation of income taxation I advocated many years ago. The present inequality of its burdens hardly needs indicating. Nevertheless, ethics says property is property, so long as there is nothing but sentiment to question it. So, I stipulate for right motive as well as confiscation. If we start the readjustment as robbery, we shall end it as robbery, and our last state, morally, will be no better than was our first. Whatever confiscatory schemes are carried on the ground of scientific justice, I am with them. So long as such schemes are advocated on the ground of sentiment, I am against them. I see that the sentiment now agitating for collectivism is quite as capable of perpetrating moral enormity as is the sentiment to which it is opposed, and that a morally rotten society will be no better off under collectivism than under individualism, whatever enthusiasts may think.

Until the formal and hypocritical retention of the emotional sanctions of conventional religion is superseded by honest acceptance of the intellectual sanctions revealed by scientific religion, there can be no real social amelioration. The watchword of genuine Socialism must be—individual status as servant of the community and reward according to service. The sanction of Socialism must be—the religion revealed by science. No Socialism can cohere motived by sentiment.

There is no sanction for confiscation in the Christian doctrine of love implying that, whatever our dealings with one another may be, they are to be determined by emotion, not by intellect. Rights only emanate from intellect, and confiscation can only be justified on the ground of rights. The Christian doctrine establishes no rights. It merely

implies concession to the weak agent—unless we contemplate the cult in its essential character, as a doctrine of absolute non-resistance. Then it constitutes all agents weak and, as I have indicated, becomes impossible. Taking it in its practically possible aspect, it is obviously irrational to invoke it, as many do, as sanction for spoliation. Really, the doctrine does not contradict the proposition that the weak have no right to live. All it does is to tell the strong to concede to the weak. But, if the strong are to be bound by this direction, they must believe its credentials as valid. Obviously, their validity is not believed, so Christianity is no real authority even for its own central direction—to yield. What then can be authority, and what use is it to invoke Christianity on behalf of spoliation? As Christianity is thus excluded as authority, there is no warrant at all—on the present conditions of advocacy—for spoliation, except the arbitrary prepossessions of the advocates. Then, obviously those who want to retain have, on the conditions, as good warrant as those who want to despoil. The result is a mere struggle between brute forces equally divorced from justice. Human struggle must accept intellect as judge, or equity cannot be the issue.

The *London Times* and other class-organs of the sort have recently been agitating themselves on account of a proposal before the London School Board to feed starving children in the Board Schools, at the ratepayers' expense. The class-organs see a tremendous vista of robbery behind this contemplated act of simple humanity towards the most miserable and helpless section of the community. (I say most miserable, as I can conceive no more miserable object than a starving child set to study.) The class-organs are right. The implication of any rationally tolerable confiscatory process is ultimate totality—the abolition of private property not directly derived through equitably adjusted wages from the State. Either private property, as now constituted, is right or wrong. If it be the former,

then charity must depend on the inclination of the individual, not on the State's arbitrary spoliation of the individual's rightful own. Feeding starving Board School children at the expense of those who have not brought them into the world is no doubt gratifying to humane impulse, but, all the same, it is the thin end of the wedge which, when fully driven home, means the disruption of private property on its present conditions of tenure. Naturally, such organs as the *Times* are staggered by the proposal. The business of rational and honest folk is to render such organs lepers in the world of journalism, as they are in the world of intellectual and moral evolution. On the other hand, so long as Socialistic writers work from the standpoint of sentiment and sympathy, instead of from that of intellect, they exemplify all the evils of retrogressive class-journalism and utterly fail to do justice to the world-moving cause it is their province to advance.

It is a significant comment on the effects of Christianity on modern society that, in these days of gigantic individual accumulations of money, it is necessary to exert public pressure to assure food or clothing for the waifs we are now cramming, for the sake of society's expediency, with what is misnamed education. Our forefathers, who believed what they professed, and whose means, measured by our standards, were paltry, needed no such compulsion as the one the mere suggestion of which has just disturbed the serenity of the organs of affluence, privilege and Orthodoxy.

From the standpoint of scientific religion, those waifs are brought into the world by God, and society is responsible for their bodily well-being until they become wage-earning units of the body politic. When they have attained that status, society is responsible if they have not adequate opportunity of obtaining, as reward for service, clothing, housing, food, and rational recreation. It is no doubt easy to revile the parents of these waifs. They, probably, in many cases, are the immediate instruments of their

children's condition. But scientific religion looks deeper than to those immediate instruments and finds that they are but the necessary effects of the malfeasance of society. In the light of modern knowledge, society will have to amend its iniquity or pay a terrible penalty. As we know, so we shall act, is God's decree. Whether we shall obey that decree by our volition, or by the compulsion of a social upheaval, God only knows. I work for the volitional transformation, and suggest to statesmen that a question more critical to the existence of this nation, and of more vital interest to her patriots than is the question of the retention or extension of her colonies and dependencies, is: Shall legislators act as they know?

NOTE D

"Various leading journals have recently been stirring the country against the iniquity of the methods and incentives which have provoked the present war in Africa," etc. etc. (p. 64). The comments in this connection also apply to some extent to a freethought organ to which, for several years, I have been a prominent contributor. This journal emulated the worst achievements of the common partisan press in fomenting the war-spirit.

Whatever opinions may be held regarding the justice or injustice of this war, my own view of what profess to be Rationalist organs is that they should either discuss political and diplomatic questions from the standpoint of ethics, or leave them alone. I can see no virtue in a freethought organ that merely assails one particular convention to gratify the prejudices of a particular set of readers, and which treats ethical concerns as do the common ruck of partisan and mercenary journals. I say that the cause of freethought is desecrated by such advocacy, just as the cause of religion is desecrated by the conventional advocacy of the organs of

sacerdotalism. If freethought does not mean intellectual and moral advancement, it means nothing of value to thinking men. Indeed, to my apprehension, partisan agitation against even demonstrably false religious convention is noxious, rather than beneficial, unless motivated by morality as its ultimate aim. I have only sympathy with iconoclasm to the extent that its aim is the establishment of scientific right. There is no evil in the retention of theological falsity except to the extent that it involves moral wrong. Though I have come to the conclusion, after mature and impersonal consideration, that this Boer war constitutes one of the most morally infamous actions in our national record, the comments offered in this work on the subject are quite independent of my personal views as to the war's justification.

NOTE E

In the chapters dealing with organic and sexual determinism I showed that the physical structure of the organism was a product of soul-fiat. In later chapters I showed that bodies, as objects of perception, as distinct from their "material," or soul, were the sensation aroused in ourselves by hypnotism of the matter-soul by our soul through the God-soul. Objects, as we sense them, are the products of what I term "personal artifice," or this hypnosis of the matter-soul. Then, as our own body is such an object, it is a product of this hypnosis, and, as being a sensed object, is just as much foreign to our essential self, or soul, as is any other object. On the other hand, the sensations (emotions, feelings, thoughts) we derive *through* this body constitute it something more than a mere object of sensory perception. In regard to these sensations, our body, during what we call life, is an integrant of our soul, or a special medium through which our soul manifests one phase of its

existence. Thus, while we perceive *it* as a sensed object, as equally foreign to our essential self as is any other object, we, on the other hand, perceive *through* it as a transitory integrant of our essential self. Though we only perceive *it* by perceiving *through* it, we still bring *it* into sensed existence by hypnotising the matter-soul, as fully as we so bring any other body into sensed existence.

Before we sense our own body, our parents' souls have hypnotised the matter-soul, as a particular "germ cell," through the fiat with which I dealt in discussing organic and sexual determinism. This hypnosis, as indicated, is an unconscious manifestation by our parents, resulting in a cell endowed with the procreative fiat, or soul-suffusion. This fiat, or hypnosis of the matter-soul, proceeds through various stages eventuating in what we call birth. While we are in our parent's womb nobody perceives this hypnosis, except as particular effects on that parent. That is, nobody hypnotises the matter-soul so as to involve our existence as a seen object. When we emerge from the womb, our body attains sensory individual existence, those who see us hypnotising the matter-soul into visualised existence as ourselves as an infant.

Our own perception of our body, at this rudimentary stage, probably only involves certain inchoate feelings, we ourselves not having yet hypnotised the matter-soul into affording us sensory experience of our own body as an object. For us, it only yet exists as an integrant of our soul, or the special medium to which I have above referred. Gradually we hypnotise the matter-soul into affording us, as a child, objective as well as subjective experience of our own body. When we die we lose both subjective and objective experience of our body—our soul, so far as regards the matter-soul, has ceased to exert fiats. Still, other souls continue to exert such fiats after we are dead. That is, they continue to hypnotise the matter-soul into our body. Gradually, this hypnosis changes, until eventually, what was

our body to others, becomes what we term chemical products of decomposition. All here is metamorphosis of sensations derived through hypnosis of the matter-soul by the human soul through the God-soul.

Everybody is assumed to sense any particular object as does everybody else. Thus, I assume that everybody senses a chair as I sense it. This involves the permanency of objects and implies the "infection" with which I have dealt in Chaps. IX. and X. It is somewhat analogous to what I have earlier dealt with and shall later deal with more specifically as type-memory or what we call instinct. If the matter-soul once comes to exist as a sub-individuality (soul underlying and constituting the *ens* of a particular body), every percipient body of the same type will be "infected" as is every other such body. In other words, every human soul will hypnotise the matter-soul into affording the particular human body (as brain and nervous system) the same impression as what we call object of sense. Thus, the object will be fixed as a "type-sensation." In a word, every human soul will hypnotise the matter-soul with the same sensory result.

Thus, so long as our soul conditions our body, that is, so long as it hypnotises the matter-soul into our body as a medium for its own fiats, we not only hypnotise the matter-soul into affording us sensations as bodily objectives, but we also hypnotise the matter-soul into affording us a particular objective—our own body, which again affords us the various sensations which we consider internal to ourselves, and call emotions, feelings, thoughts. Our soul first hypnotises the matter-soul into affording us, as an infant, subjective knowledge of our body. Then it hypnotises the matter-soul into affording us knowledge of our body and other bodies as objects of what we call sensory perceptivity. From birth to death, all we experience—health, sickness, pleasure, pain, passion, thought, sentiment, emotion—emanates through this soul-suffusion or hypnosis, with which I shall

deal more specifically in a later volume. To illustrate bodily disease as a consequence of this hypnotism I may instance the production of morphological changes (stigmata, etc.) through ordinary hypnotic suggestion.

. NOTE F

See p. 125 for reference to the following case. Albert Moll writes: "Let us now ask, To what extent can the involuntary muscular system be influenced by suggestion? The peristaltic motion is relatively easy to affect. I have had several experiences of the facility with which the bowels of some hypnotics are affected by suggestion. I say to one of them, 'In half an hour after awakening your bowels will act.' This is certain to happen. 'To-morrow morning at eight your bowels will act.' The effect follows. 'To-morrow between eight and nine your bowels will act three times.' Exactly the same result, though the subject remembers nothing of the suggestion on awaking" (*Hypnotism*, Albert Moll. Walter Scott, 1891, p. 109). Such cases as the above are further dealt with, from my own standpoint, in a chapter devoted to Soul, in a later volume.

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